Also inside: Big Data, Big Jobs?
Tips for Successful Mobile Apps | Chicago Adds Cloud to IT Revival Plan

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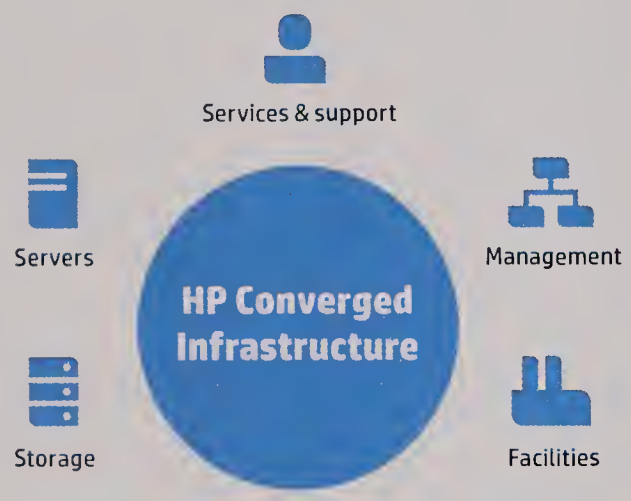
IT is learning to *quickly* tap into creative ideas and **harness the power of innovation** for *competitive advantage.*

EXECUTIVE VIEWPOINT

Lower Costs and Increase Agility in the Cloud with Blade Technology

HP's David Gaston, Director, Americas Industry Standard Servers and Software, HP Enterprise Group, explains how a **Converged Infrastructure** enables IT leaders to manage, secure, and govern the cloud infrastructure and ensure integration with the traditional IT environment



HP Blades:
68% TCO improvement over traditional infrastructure

- **Reductions in energy use**
- **Reductions in capital purchases of server hardware**
- **Lower IT labor costs**
- **Reduced power, storage and networking components**

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1. What is the Converged Infrastructure and what role do blades play here?

The Converged Infrastructure helps CIOs provision and manage IT services much faster and more efficiently than the traditional IT world of technology silos. This happens through deploying shared pools of interoperable resources including servers, storage and networking. CI is powerful because it delivers services across traditional IT networks, private clouds and public clouds, which is important as large companies are now running hybrid infrastructures. Blade technology plays a leading role in this new infrastructure because they are flexible, self-contained servers that share power and components. Blades are modular and multi-purpose; they can add or decrease power and function to the environment quickly, as business needs change. Blades also offer unified systems management abilities that are important in a shared-resources environment.

2. How do Blade systems save money?

Moving from traditional servers to HP Blades can save your business up to 68%. In the big picture, blades offer IT organizations flexibility while also maximizing value from a smaller hardware footprint. Capital expenses from blade systems are lower, since blade servers can share power, storage and networking infrastructure, unlike individual rack servers. IT departments can also reduce installation and deployment labor costs, given the drastic reduction in LAN, SAN, and power cables needed for blade servers. Blades are also highly energy-efficient, typically providing 70% more compute power per watt than traditional servers. That can really shave down utility bills in a data center.

Shift more than 70% of IT resources from operations to innovation.

3. What's the business benefit of blades?

For too long, IT has been running a maintenance-heavy model. An astronomical 70% of budgets are spent managing existing operations while only 30% goes toward IT innovation and strategic projects. With HP Blades using Intel Xeon processors, CIOs have the opportunity to switch these percentages, so that a majority of IT spend is supporting the business in revenue-driving activities. This efficient, shared infrastructure means that the business can deliver new services and applications to users on the fly, without buying and maintaining a bunch of new hardware. Then there's reliability. Companies using HP Blade technology typically show improved uptime and 30% less server incidents. HP Blades have received recognition in technology and market leadership by IDC, Gartner, InfoWorld and others. That gives CIOs peace of mind that they're using proven, innovative technology to build a modern, business-friendly infrastructure.

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95% reduction cables and components

HP Blades —
70% more compute power per watt

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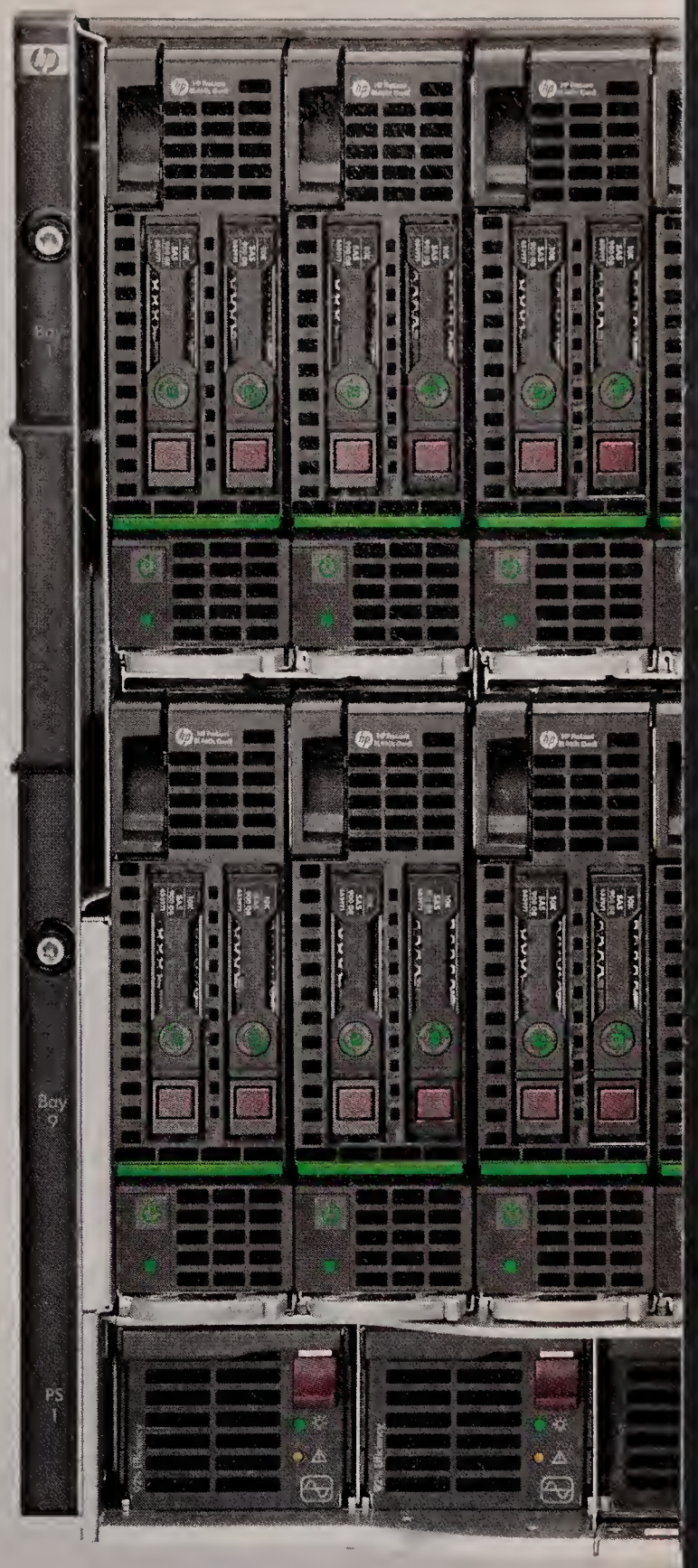
The power of HP Converged Infrastructure is here.

Get the new Forrester study about blade server impact on management and agility at **hp.com/servers/gen8blades6** or **scan the QR code below.**



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IT INDUSTRY

HP Heads to Court as IT Staffers Jump to GM

AFTER SEEING 18 key IT staffers suddenly quit to take new jobs at General Motors, Hewlett-Packard has asked a Texas court for permission to depose two former managers to find out if employment contracts were violated.

HP is involved in an ongoing restructuring effort that includes thousands of job cuts, but these employee departures were apparently unexpected and unwelcome.

HP reduced its overall workforce by 17,800 employees in 2012, advancing more than halfway toward its goal, announced last May, of cutting its worldwide head count by 29,000, or 8.3%, as part of a turnaround effort. As of Oct. 31, HP employed 331,800 people worldwide, according to its Dec. 27 10-K filing with the U.S. Securities and Exchange Commission.

Most of the cuts came via layoffs, but some didn't. On Nov. 30, 18 of HP's Austin-based IT workers "resigned en masse and without notice" and "immediately began working" for GM's new Austin IT Innovation Center, according to court documents filed by HP in December.

A longtime HP customer, GM has said that it is moving away from outsourcing and is bringing some of its IT work back in-house. As part of that effort, it is filling 500 positions to staff the new IT center in Austin.

In its filing with the Travis County, Texas, district court, HP said the departures affected at least four teams in its IT organization, and it further stated that it "strongly suspects that something other than mere coincidence" is behind the mass resignations.

A GM spokesman declined to comment.

– Patrick Thibodeau

IT RESEARCH

U.S. Could Fall Behind China in R&D Race by 2023

A new study predicts that America may lose its title as the global leader in R&D spending by 2023.

If the federal government's R&D spending continues to decline or remain flat, China could overtake the U.S. in spending on research and development in about 10 years.

The U.S. currently holds a big lead in R&D spending over China, with federal and private-sector investments expected to reach a combined $424 billion this year, for a 1.2% increase over 2012 levels.

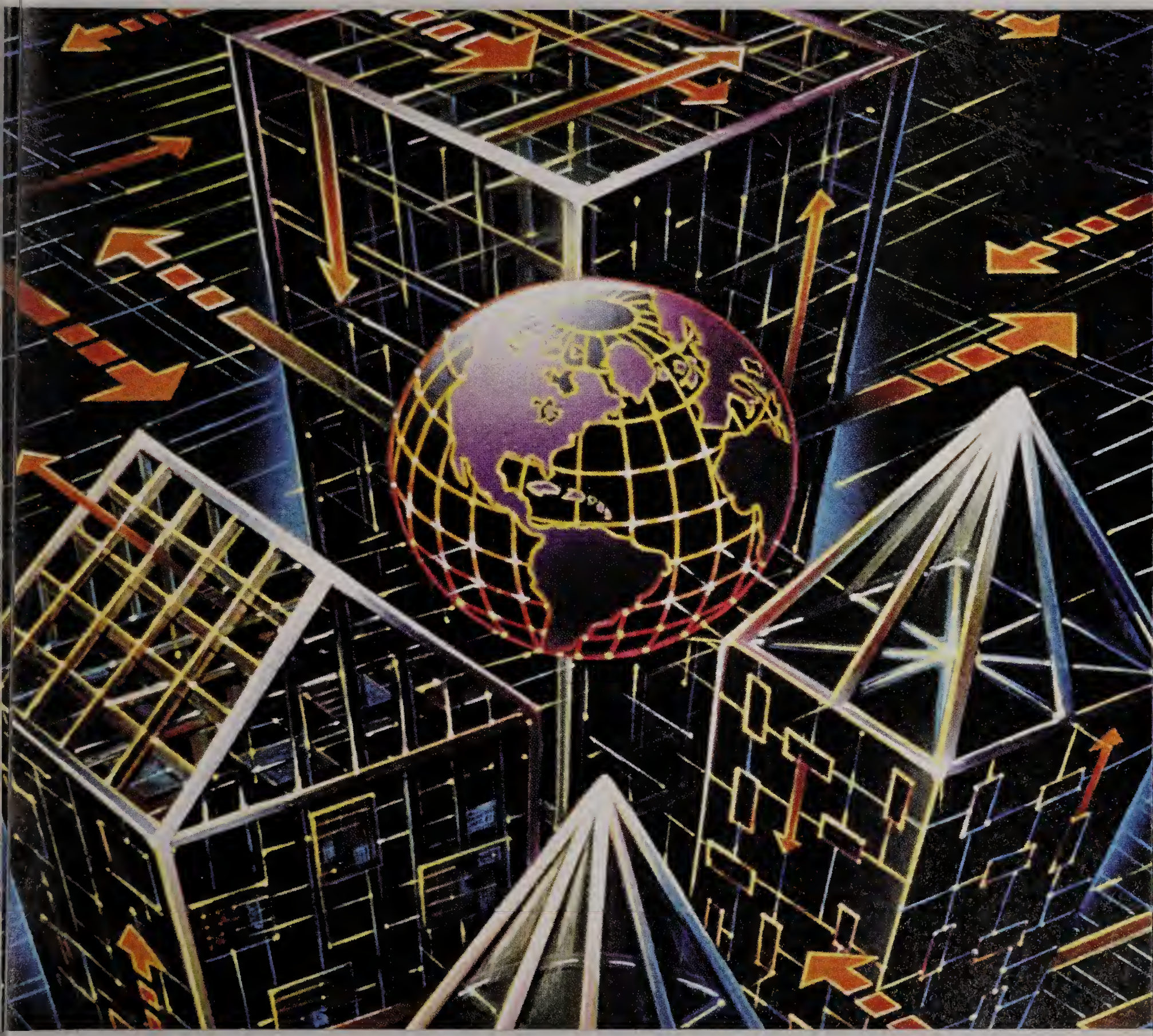
In contrast, China's overall R&D spending is slated to hit $220 billion this year. That's just over half of the U.S. total, but it represents an 11.6% increase over 2012. And China has been increasing its R&D spending at a similar rate for years, according to the 2013 Global R&D Funding Forecast prepared by Battelle, a research and technology development organization, and *R&D Magazine*.

A big share of U.S. research is funded by the federal government, which this year is expected to cut its allotment for R&D by 1.4% to $129 billion. This is seen as significant because the government funds basic research – projects that can take many years to deliver results, but which can pay off with new jobs and even new industries.

India is also investing heavily in R&D, raising its funding 12% to about $45 billion.

- PATRICK THIBODEAU

How InterSystems invented a database system for complex data types.



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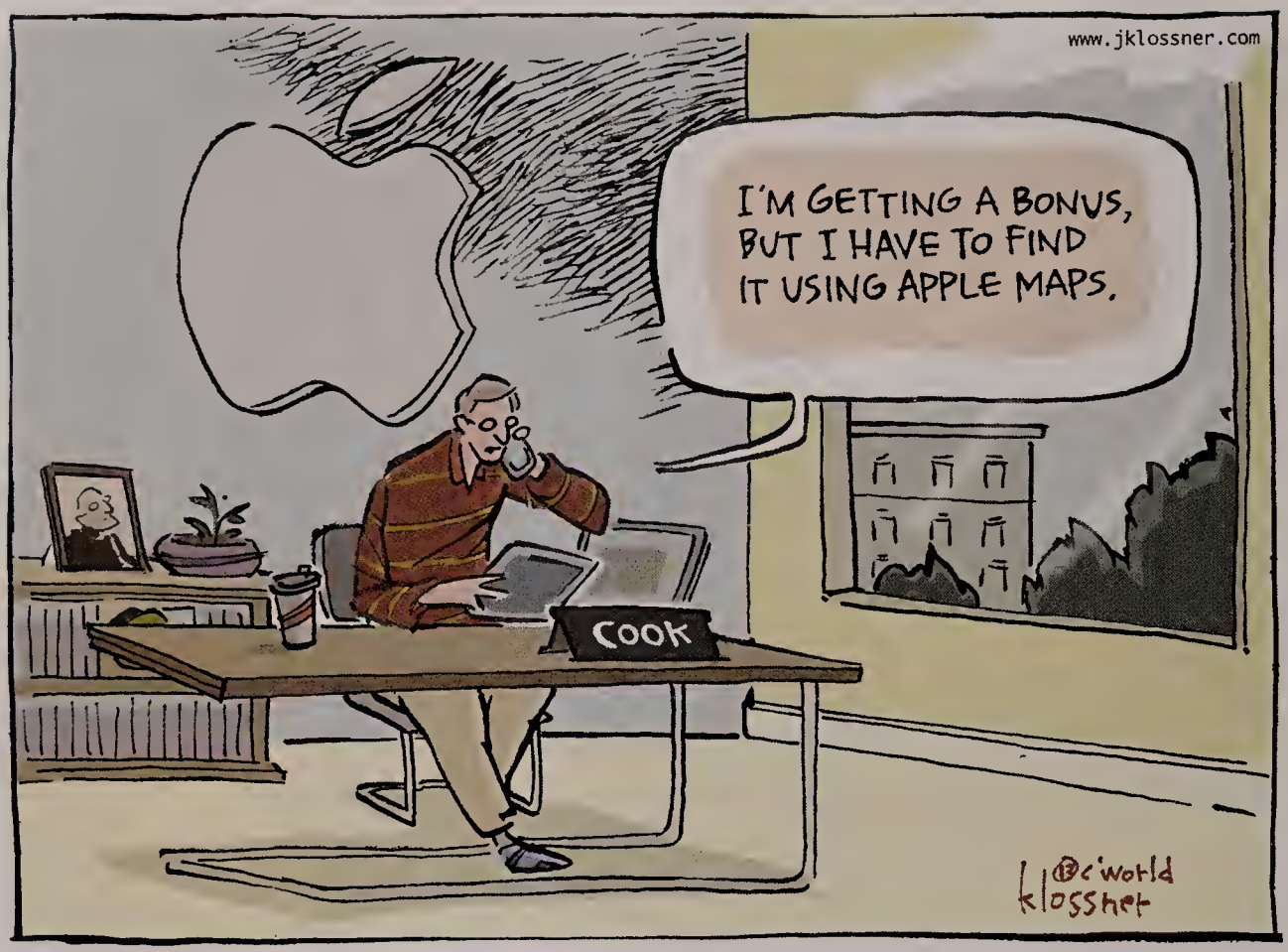
By John Klossner



IT MANAGEMENT

Pay Package Keeps CEO Cook Tied to Apple

APPLE GAVE CEO Tim Cook a 55% salary increase for 2012 and awarded him a $2.8 million bonus but said his overall compensation for the year was still down by 99% compared with 2011 levels.

In fact, Apple said, Cook's pay is "significantly below the median" level of compensation for top executives at comparable companies.

But even taking into account Apple's size and its high-revenue year, Cook's pay was certainly adequate, said Don Lindner, executive compensation practice leader at WorldatWork, an association for human resources professionals. "The single biggest factor in executive pay is the size of the company, and Apple obviously is huge," he said. "But Cook has not been in the job very long. It may take a period of years for him to be paid at the median."

Cook's 2011 package total was skewed, however, by a massive grant of 1 million Apple shares, worth $376 million of the $378 million total package. Those shares are now worth over $532 million at today's prices, but the shares vest in equal parts in 2016 and 2021, assuming Cook is still with the company.

"There was no competitive reason" for awarding more stock to Cook this year, said Bob Buford, a compensation consultant. "They're already married to the guy for 10 years."

Apple guidelines put in place after the death of Steve Jobs require the CEO to own shares of company stock with a value equal to 10 times the base salary. The idea is to keep the top executive at Apple, working for the long-term success of the company, by tying his fortunes at least in part to the company's.

Jobs owned approximately 5.5 million shares of Apple stock at the end of 2011.

"Shareholders like to see that senior management has skin in the game," Lindner said. That said, 10 times base salary is "very high," he continued. Noting that the typical rate is five times base salary, he added, "Apple is making a big statement here."

– Gregg Keizer

Micro Burst

Marvell Technology must pay

$1.17 billion

for infringing on disk drive patents held by Carnegie Mellon University

SOURCE: U.S. DISTRICT COURT, WESTERN PENNSYLVANIA

IT BUDGETS

IT Spending Expected to Grow This Year

Enterprises that buy new mobile devices and invest in security and storage management tools will give IT spending a boost this year.

Worldwide IT spending for 2013 is expected to hit $3.7 trillion, a 4.2% increase from 2012's $3.6 trillion, according to research firm Gartner, which is becoming more optimistic about the global economy.

Gartner divides IT spending into five segments: devices, data center systems, enterprise software, IT services and telecom services. The firm expects spending in all five segments to grow this year, with devices and enterprise software seeing the biggest increases.

The devices category includes PCs, tablets, mobile phones and printers. Gartner expects global spending on those products to reach $666 billion this year, up 6.3% from last year. In comparison, the firm said spending in this segment grew 2.9% from 2011 to 2012.

Worldwide enterprise software spending is expected to grow 6.4% to $296 billion.

Gartner said enterprises are trying to get more value from their IT spending, by investing in supply chain and customer relationship management software.

– MIKAEL RICKNÄS, IDG NEWS SERVICE

Chicago Adds Cloud To IT Revival Plan

The city's decision to use Microsoft's hosted email and office apps is the latest move in an effort to modernize IT operations. By Patrick Thibodeau

EMAIL IS A COMMODITY, says Chicago CIO Brett Goldstein, and that's why city officials have decided to shift to cloud-based mail services as part of a broad effort to improve IT operations.

Chicago Mayor Rahm Emanuel this month disclosed that the city plans to use Microsoft's 365 cloud services to deliver email and desktop applications to some 30,000 employees. The Chicago city government currently uses three separate internally managed email systems.

"I'm going to be getting better service, better functionality, at a lower cost. And that's particularly important when you are in municipal government," said Goldstein.

The city expects to save $400,000 per year over the course of its four-year agreement with Microsoft.

Government adoption of public cloud services remains low, however, making Chicago an early adopter along with some federal agencies and state and local governments in states like California, Wyoming and Colorado.

Research firm IDC expects use of cloud services in the public sector to grow 50% this year from 2011 levels, but that will still leave cloud usage in the government market at just 1.5%.

IDC analyst Shawn McCarthy said governments often overestimate the savings potential of moving to the cloud. "The savings that they could get don't always materialize," he said, in part because users often delay shutting down their old desktop applications.

In Chicago's case, though, the move to the cloud is just one part of a broader strategy for streamlining IT operations devised by a CIO with a background in government, the tech startup world and big data. "We need to be thinking like an enterprise," Goldstein said.

The goal is to move away from siloed, department-focused IT operations to an environment where economic data, public safety statistics and other data sets are pulled together to facilitate data sharing, he noted.

The city's goal is to build systems that support deductive and inductive approaches to analyzing data that may, for instance, lead to the discovery of previously unrecognized relationships, he added.

"Data is at the core of how we [will] continue to do government better," Goldstein said.

Chicago is trying to keep the cost of the massive project in check in part by using some open-source technologies, Goldstein said. The city's big data initiative, for instance, uses the open-source NoSQL database MongoDB.

"I don't believe in five-year ROIs," said Goldstein, adding that he prefers projects to have relatively quick paybacks.

Goldstein's background includes a stint as IT director at OpenTable during the early days of the online restaurant reservation service. He also served as IT director in the Chicago Police Department, holding the rank of commander, and as Chicago's chief data officer before becoming CIO last June.

He has master's degrees in criminal justice and computer science, and is pursuing a Ph.D. in criminology at the University of Illinois-Chicago.

Goldstein adamantly rejects the idea that government work is not as desirable as private-sector endeavors.

"One of the things that drives me crazy is this idea of 'good enough for government work' — that is not OK," he said. "I am going to raise the bar really high. I don't want people pointing to IT as inhibiting business; it should be enabling business." ◆

> "I am going to raise the bar really high. I don't want people pointing to IT as inhibiting business; it should be **enabling** business."
>
> — **BRETT GOLDSTEIN,** CIO, CITY OF CHICAGO

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New Congress Seen Shunning SOPA

Backers fear a new bill like the Stop Online Piracy Act would elicit a repeat of last year's massive online protests. **By Patrick Thibodeau and Grant Gross**

AS A NEW U.S. CONGRESS begins work this month, few insiders expect that there will a rush to create new versions of the controversial Stop Online Piracy Act (SOPA) or the Protect IP Act (PIPA).

Internet antipiracy legislation, as embodied by SOPA in the House and PIPA in the Senate, was by far the most controversial tech issue taken up by the outgoing Congress.

The bills would have given the U.S. Department of Justice and the Immigration and Customs Enforcement agency the power to order domain-name registrars to cut service to websites accused of online piracy or counterfeiting U.S. products. They also would have given officials the authority to prohibit search engines from linking to such sites, and to take action against online advertisers and payment processors with business ties to suspected pirates.

A humongous public outcry prompted a wholesale retreat by supporters of the bills; Senate leaders cancelled a PIPA vote, and SOPA was withdrawn by its sponsor in the House.

On one level, the battle was between industry groups: big music and movie content providers vs. the tech industry. But for millions of people who protested on Reddit and elsewhere, it was about something more fundamental: Internet freedom.

While some business groups are still pushing for government action against online piracy, lawmakers likely lack the collective will to face a protest similar to last year's, in which a number of websites chose to "go dark" to illustrate the effect the laws could have.

"That was an avalanche they've never seen," said Ed Black, president and CEO of the Computer and Communications Industry Association, a trade group that opposed the bills. "They're going to tiptoe in this area very carefully."

Even weaker bills that would affect only advertisers and payment processors doing business with suspected piracy sites are likely nonstarters, Black said.

A spokeswoman for Rep. Lamar Smith (R-Texas), SOPA's main sponsor, said the congressman has no plans to introduce such a bill in 2013. He will defer to Rep. Bob Goodlatte (R-Va.), who is now chairman of the House Judiciary Committee, she said.

Goodlatte, a co-sponsor of the 2012 SOPA bill, wouldn't comment on his plans.

A spokeswoman for Sen. Patrick Leahy (D-Vermont), the primary sponsor of PIPA, didn't respond to a request for comment.

The Recording Industry Association of America, which last year pushed for passage of both bills, plans to focus on other issues. The RIAA's "core mission" now is to promote its array of digital formats and focus on "voluntary marketplace initiatives," said spokesman Jonathan Lamy.

Opponents of the bills hope to continue having a say in debates about copyright reform, said Tiffiniy Cheng, co-founder of Fight for the Future, a digital rights group.

In November, the Republican Study Committee, a group of conservative House Republicans, published and then retracted a paper advocating the weakening of some copyright protections, Cheng noted. "It seems like the SOPA protests and blackout created an opening for a discussion on copyright reform," she said by email. "We'll be working with groups and the public on a plan."

Experts say that any new legislation would likely aim to curb million-dollar-plus damage awards for infringement, or would be similar to the Pandora-backed Internet Radio Fairness Act, which aims to set royalty terms for Internet broadcasters. ◆

Gross *is a reporter for the IDG News Service.*

> "This was an **avalanche** they've never seen. They're going to tiptoe in this area very carefully." – ED BLACK, CEO, COMPUTER AND COMMUNICATIONS INDUSTRY ASSOCIATION

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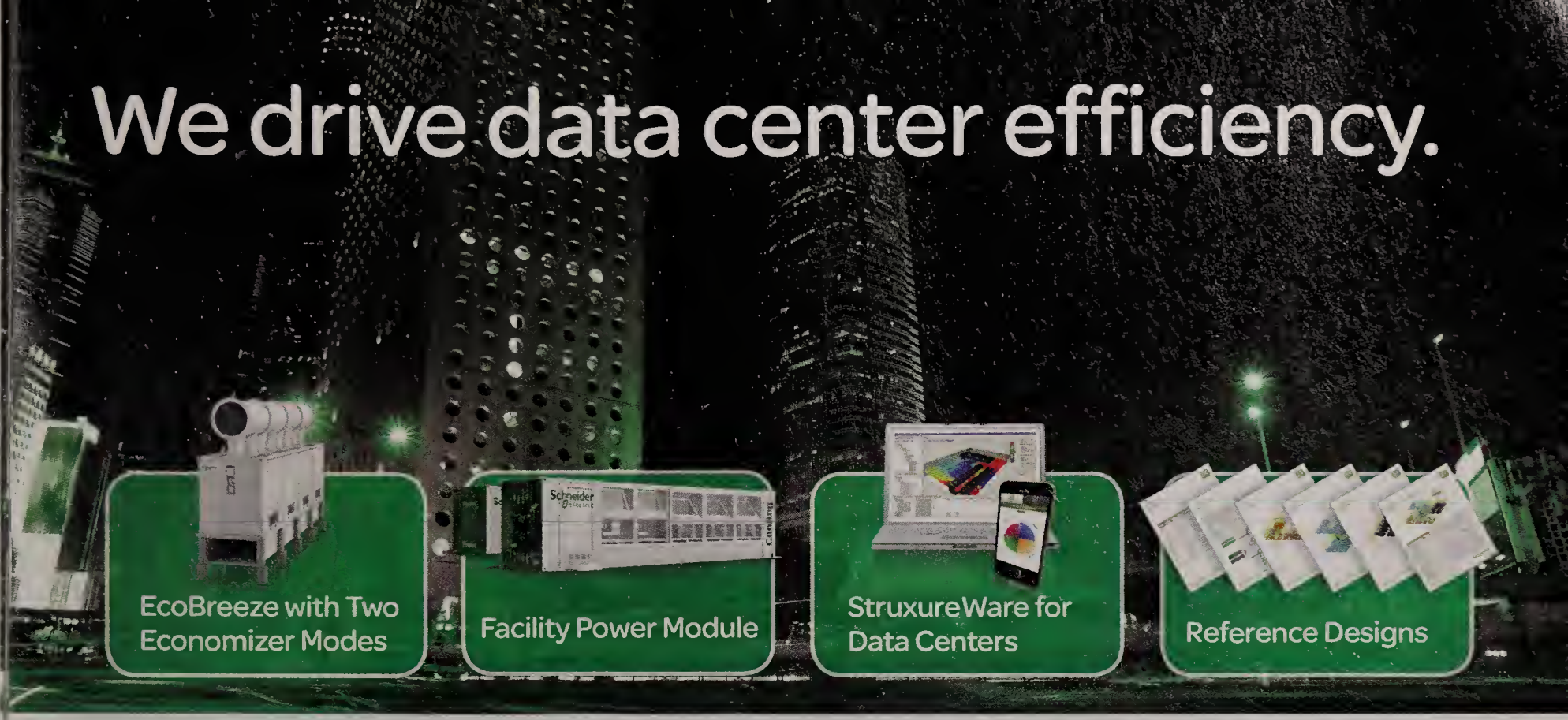

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Maridan Harris

Tech work can – and should – be fun, says this IT leader and expert motivator.

Family: Husband and a Saint Bernard dog named Bear

What's your next career step? "I want to keep doing things I find very fun. It really is that simple."

Do you have any hobbies? Coach and mentor for Junior Olympics volleyball; playing volleyball, golfing, diving and snowboarding

Which do you prefer, California or the Northeast? "I like them both for very different reasons. It's cool out here [in the Northeast] having the seasons. Fall is gorgeous. The people are nice, there's a lot more tradition here, which is fun. But California is always going to be home. And I could play beach volleyball on Saturday and snowboard on Sunday."

PHOTOS COURTESY OF PHILIPS NORTH AMERICA

THE ENTHUSIASM *that Maridan Harris has for her job, and for technology in general, is clear after talking to her for just a few minutes. Her philosophy: "You should love what you're doing or find something that you do love." The vice president of IT at Philips North America in Andover, Mass., which develops lighting, lifestyle and healthcare products, Harris welcomes opportunities to share her ideas on how to build teams that enjoy work as much as she does. She spoke recently at a Women In Technology International panel on the need to balance execution with a need to have fun at work. Here she offers more of her thoughts on the topic.*

What's your role in ensuring this balance in your team? Everyone has something different that motivates them. I like bringing in improvements that help people do their jobs better or get them information to do their jobs better. I like seeing people's faces light up when I bring in something that makes their jobs easier. I find it fun to give people

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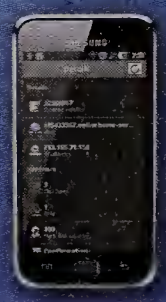

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Maridan Harris and her husband, Mike, on a golf trip in Maine.

> **You have to have the ability to make mistakes,** learn from them and move on. Otherwise, you'll stifle all creativity.

tools that help them do what they do better. And I think that IT people get excited when you use products that they created. So I've always believed that they need to know they're making a difference or leaving a legacy. But when you're working with an internal IT group, they're not so close [to users] that they know how something gets used. We use an agile environment, so they work closer with the business, they know their product is going to be used, and they get to see it used.

How else do you motivate IT people? It's important to celebrate success. Acknowledging people's accomplishments is extremely important. It's great as a leader if I do it, but when the business and the people using a product tell someone [that his or her work] was fantastic, that means a lot more.

You've talked about delivering operational excellence and high performance. How do you define and measure those in your IT organization? Operational excellence is the ability to take things into a steady state while still being able to improve them. You have to have the stuff working to have a foundation of trust. And you have to be predictable, deliver on your promises and do what you say you're going to do. The more motivated and engaged your team is, the more high performance your team is. Then you have to set goals for yourself, and they have to be stretch goals. You need to strive for improvement.

What do you mean when you talk about focusing one's personal positive power? It's taking all that positive momentum you've got and using it. It's taking your positive energy and focusing on those strengths. I do some coaching for a volleyball team, and I look at what each girl brings to the team and I put them in positions where the skills they have are used the most. I wouldn't make my best passer my middler or hitter. So it's [understanding] the diversity of the team and playing to their strengths. Rather than making everyone good at everything, take the people who have certain skills and make them great and improve what their strengths are and not focus so much on what they're not so good at. If you look at IT, you don't need a person who is good at every single technology. You get the people who are really good at the skill set you need, and whatever their skill is, that's what you put them in there for — and then continuously develop them.

Does that make people feel pigeonholed? We give a lot of opportunity for change and growth. People who want to move from one area to another can do that. When you're learning new skills, that's also a motivator to help you grow. And the more you get exposed to, the more you can decide what you want to work and focus on. But I don't think you can be everything to everyone. You have to learn how to do the things that are interesting to you and move up in that work. It doesn't mean you don't have breadth in your skills, but it does mean you have to have certain competencies.

You're in a multicultural, global organization with many layers. What skills are needed to be successful in moving across departmental levels? Open-mindedness is the biggest, and a willingness to learn. It's more attitude than anything else. You have to be able to put yourself out there, take a chance on something and be open to learning different things.

Can this be developed? You can't make anybody want to learn. But you can encourage it. You can be open to people making mistakes. We end every project with a lessons learned. You have to have the ability to make mistakes, learn from them and move on. Otherwise, you'll stifle all creativity.

What are the key skills an IT manager needs to be successful in this type of organization? You have to be someone who values the diversity and the creativity that comes from different viewpoints. You have to want a team that comes from different backgrounds, different places, [because] you want all these different ideas. And once you have that, you have to be open-minded. You have to listen, because each idea will lead to another.

How can IT workers aspiring to management cultivate these skills? It takes some risk. You have to decide you want to do it. You have to decide you're OK with putting yourself out there. It's like anything else: If you're not exposing yourself to some sort of risk, you're not exposing yourself to opportunity.

— *Interview by* Computerworld *contributing writer* **Mary K. Pratt** *(marykpratt@verizon.net)*

BART PERKINS

After Sandy, Opportunity

> The whole point of an IS contingency plan is to be prepared before catastrophe strikes.

IT'S A PRETTY SAFE BET that a lot of organizations in the Northeast are bulking up their business continuity plans (BCP) right now. That's because many of them were left in the rubble following Superstorm Sandy, and experience is often the best teacher.

If your organization escaped that disaster, you should let the experiences of those that got hit be lesson enough for you. Don't wait until it's too late; the whole point of a BCP and an information systems contingency plan (ISCP) is to be prepared before catastrophe strikes.

Unfortunately, we're all adept at postponing planning. Let's face it: ISCPs are not cheap, sexy or fun, and often they aren't even used after time, money and effort have been spent developing them. And we tend to think that a business-crippling disaster just isn't likely. The odds are indeed low. Category 5 hurricanes like Andrew (South Florida, 1992) are relatively rare, and the chances of one hitting New York are extremely slim. That's one reason why Sandy is so instructive.

Compare it with Katrina (Gulf Coast, 2005), which trumped Sandy in many ways. A Category 3 storm when it went ashore, Katrina caused damage that was assessed at $120 billion and led to 1,836 deaths. Sandy was barely a Category 1 when it hit the coast, and it caused $30 billion to $60 billion in damage and resulted in 109 deaths. But Sandy had a much bigger impact on business. The three states most affected by Sandy are home to 85 Fortune 500 headquarters, compared with 20 in the area affected by Katrina. Sandy's power outages affected 8.4 million people (and thousands of businesses), whereas Katrina left 1.7 million people without power. And Sandy's impact was felt throughout the world economy when it forced the closure of the New York Stock Exchange and many U.S. government offices.

In other words, a storm doesn't have to be a record-breaker in terms of strength to cause tremendous havoc. And businesses located along the coast aren't the only ones at risk. There are all kinds of disasters, including earthquakes, tornados, wildfires, tsunamis and blizzards.

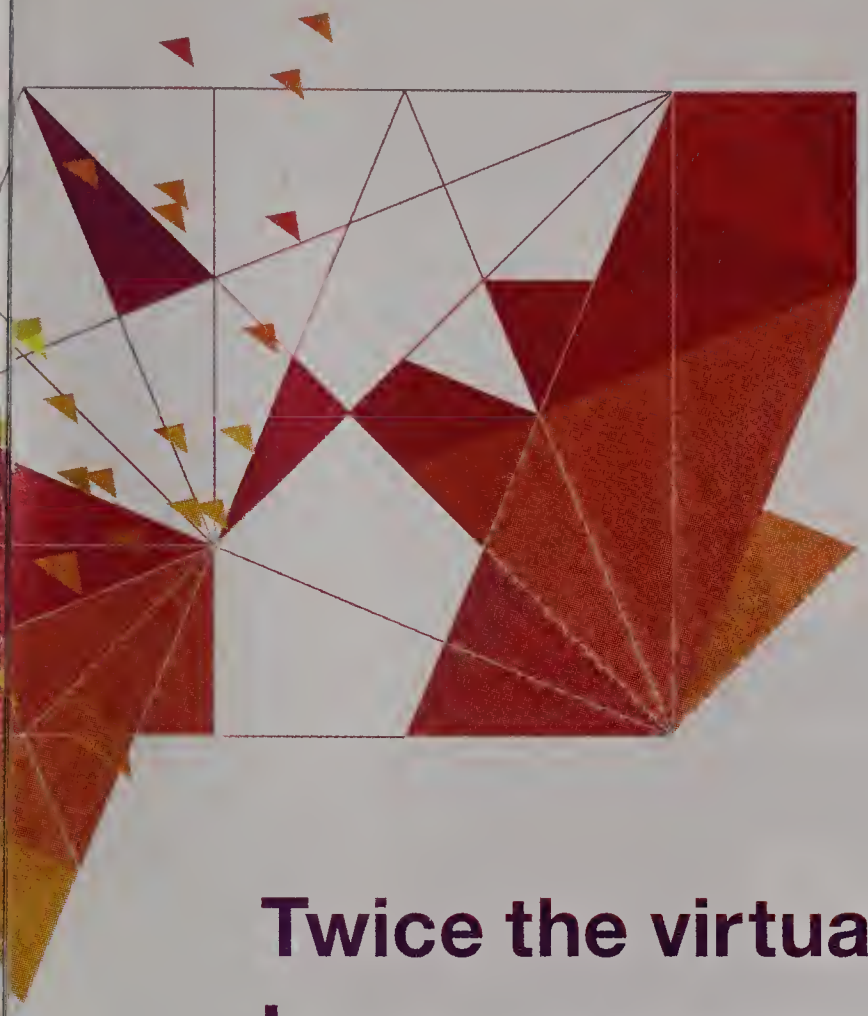
I've heard people argue that ISCPs don't increase revenue, cut costs or create new services. That's true, but they can help to avoid costs and prevent devastating drops in revenue. And creating an ISCP identifies potential vulnerabilities, whose elimination strengthens IT robustness.

What's more, an ISCP can help with compliance. Increasingly, professional organizations and federal guidelines strongly encourage or mandate BCPs. For example, the National Association of Securities Dealers requires the creation and maintenance of a BCP. Sarbanes-Oxley Section 404 requires management to establish and maintain "adequate internal control over financial reporting." The inability to recover after full or partial outages could be considered noncompliance.

An effective ISCP project has four phases. First, fund it. Second, create a comprehensive ISCP. (NIST provides an excellent model.) Third, test it regularly to verify the integrity of planned operations and to ensure that employees understand their responsibilities. Fourth, update the ISCP periodically, to reflect infrastructure changes and add support for new services, such as BYOD, mobile access and big data. Beyond that, examine existing ISCPs to find holes in coverage. And don't forget supplier exposure!

With Sandy fresh in mind, take advantage of management's increased awareness of the threat of natural disasters. But act quickly; memories will fade. Develop an ISCP before this window closes. ◆

Bart Perkins is managing partner at Louisville, Ky.-based Leverage Partners, which helps organizations invest well in IT. Contact him at BartPerkins@LeveragePartners.com.



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READY, SET, COMPETE

In the new 'fail fast and move on' world of business, IT is learning to quickly tap into creative ideas and **harness the power of innovation for competitive advantage.** **BY STACY COLLETT**

A FEW YEARS AGO, Hertz learned that innovation isn't just a luxury to be taken out for a test drive now and then, but rather a business imperative. Without new ideas constantly in the pipeline, the car rental giant would get run over by its competitors.

"We get copied a lot," says CIO Joseph Eckroth. "Our competitors see [our innovations], and six months to a year later, they're introducing their own versions of it. Speed of thought and speed to market are absolutely critical for us to keep our lead. If we stop, we're dead."

Hertz isn't the only company that hears its competitors' footsteps and is relying on innovation to maintain its edge. Indeed, a loosening up of IT budgets and the race for competitive advantage

GANDEE VASAN / GETTY IMAGES

in a post-recession world, coupled with a flood of new technology platforms, have created the perfect storm for business innovation.

According to *Computerworld*'s Forecast 2013 survey, there's a sense of cautious optimism as IT organizations move into the new year. For instance, 43% of the 334 respondents said they're seeing an increase in their IT budgets, versus 36% last year. And 64% reported that they plan to make a major IT purchase or upgrade in the next 12 months, up from 60% last year.

But these days, innovators must play by a new set of rules. IT leaders find themselves taking a fresh look at project management and resource planning as they seek to accommodate business demands for speed to market while assessing a deluge of new tools driven by new technologies. Developing the "next big thing" requires fearlessness, a fast pace and a fascination with new ideas, not to mention reliable partners and an open-minded team of professionals who can imagine the possibilities — a tall order in an often "command and control" IT environment.

Here's a look at how four IT executives have learned to "fail fast and move on" with innovation while maintaining a competitive advantage in a cutthroat marketplace.

We're trying to introduce this culture of innovation. That's everybody's job.

JOHN PRUSNICK,
DIRECTOR OF IT INNOVATION AND STRATEGY, HYATT HOTELS

Seeking the Ultimate Guest Experience in 'Lab Hotels'

The next time you visit a Hyatt hotel, you may be part of one of its experiments to improve the customer experience, perhaps without even knowing it. Hyatt Hotels and Resorts wants to reinvent the art of hospitality through technology. So it has identified eight "lab hotels" — four in the U.S., four abroad — where John Prusnick, director of IT innovation and strategy, leads major, "disruptive" IT experiments.

"We're not looking at just wanting to improve upon current solutions," Prusnick explains. "We're trying to come up with ideas that are transformative."

At any time, there are seven to nine unique projects under way at the lab hotels, and IT spends no more than 90 days on any one idea. Failure is definitely an option.

"Quite honestly, almost every idea fails fast. The solution we settle on relies on iterations of the original idea. Many times, perhaps as high as 60% of the time, we find that we revisit the original idea and find the solution to be something completely different," says Prusnick. The projects that don't make the big time are chalked up to "return on experience" rather than ROI, he adds.

One of Hyatt's most successful ideas emerged from the business side and was put to the test in a lab hotel. Hyatt International's president announced that the company needed to change the way guests check in.

SHAKING THINGS UP

It's easy to create a technology wish list, but the devil is in the details, which could explain why some IT workers aren't enthused by innovation projects.

"The challenge for IT people is that we come traditionally from a lens of 'command and control,' " says John Prusnick, director of IT innovation and strategy at Hyatt Hotels and Resorts. "We want to have things standardized, lock them down and make sure they work. We want consistency in delivery, and we don't want to have changes introduced that will cause us grief down the road."

While empathetic to that viewpoint, Prusnick encourages IT staffers to understand the importance of continually trying to improve their products. "We want them to change to a more communicative and collaborative way and have dialogue with users on how they can improve their offerings," he says. It could be as simple as adding pictures to Active Directory, so people know who's sending an email, he adds. In the past, IT staffers would have balked at such an idea because it would create new infrastructure needs. But today, "they understand what the user needs to become more productive and effective," Prusnick says. "They will incrementally improve that product by implementing that feature or function."

Day-to-day IT responsibilities and the uncertainty of "experiments" can also limit IT staff's involvement in innovation projects. "There has to be some negotiations about how time can be made in a person's schedule for these workshops and to follow up on ideas," says Bob Krestakos, CIO at Steelcase. "But once you have a couple of ideas that really take hold that come from that innovation mentality, it gets easier and easier" to get IT employees involved.

At Hertz, CIO Joseph Eckroth doesn't try to fit all IT employees into the innovation mold. "Not everyone is entirely comfortable with the process by which we [innovate]," he says. But when it comes to the core innovation team, "you've got to hire and select people who have in their DNA the ability to create turbulence," he adds. "They question and [blend] the normal discussion with disruptive discussion. That's the type of people I want to have" in brainstorming sessions.

— STACY COLLETT

The Rooms Operations team, together with IT, decided to get rid of the front desks and make every associate a "host." The IT team created a mobile tool to untether front desk staffers and allow them to move about the lobby and interact with guests in a more personal way. The iOS-based iPad application includes hardware for credit-card swiping and encoding room keycards. The lab trial was so successful that the company decided to expand the mobile solution even further.

At the Hyatt Regency O'Hare in Chicago, mobile hosts are now stationed at the airport shuttle center, where they greet guests, check them in and issue room keys. "That has been a huge win for us from a customer intimacy standpoint," says Prusnick. "The guests feel like they're being greeted in a VIP way. They don't have to wait in line, so that saves them time."

As the keeper of Hyatt's major innovation projects, Prusnick's biggest challenge is making sure everybody realizes that they're all on the same team.

"Sometimes I feel like I'm stepping on other people's toes," he says. "Making sure that we can facilitate great cooperation between IT and the business can sometimes be a challenge." That's especially true when other departments come up with innovative projects on their own and Prusnick has to intervene to make corrections or stop the project until the innovation team determines if it's really needed.

"At the end of the day, everybody is looking for the best experience possible for our guests and [employees]," he says. "We all have the same goal. It's just a case of who gets to run it and be the project manager." In fact, all employees are trained in "Hyatt Thinking," meaning they're encouraged to come up with ways to improve existing solutions. "We're trying to introduce this culture of innovation," he adds. "That's everybody's job."

Partners = Speed to Market

The biggest banks are continually developing new services and payment applications. Speed to market and unique offerings are required to stay ahead of the pack.

At Capital One, Monique Shivanandan, senior vice president and CTO, relies on a new innovation lab team and trusted partners in the startup and university realms to bring new ideas to market fast.

In 2010, Shivanandan launched the Capital One innovation lab and staffed it with 20 "hard-core developers and product managers" in San Francisco and Washington. She then partnered with the FinTech Innovation Lab, a development organization that brings together New York area startups focused on banking applications, to tap into ideas and expertise from the outside. So far, the partnership is credited for new offerings such as Capital One's Mobile Deals app.

"It's been an incredible opportunity for both of us," says Shivanandan. "We've been able to get into the marketplace a little bit quicker because we have these relationships, and we've been able to help some very small companies really advance their agendas and frame the product or service so they're more realistic and more marketable."

She also partners with research groups at MIT, Georgia Tech and Stanford.

The lab works on just three to four projects at a time, and a steering committee made up of business and IT leaders meets quarterly to develop a list of promising ideas to work on in the next two to three months.

"If you have the product people sitting next to the developers sitting next to the testing folks, and you're all just working through it in a very rapid and iterative cycle, you will get something very good in 60 to 90 days," says Shivanandan. "It may not be perfect, but you will have such a good idea of what it is."

Sometimes, ideas that might have been scrapped by one business unit may turn out to be valuable to another part of the company. Capital One's team discovered, for instance, that a credit card project that was about to be killed was well suited for the small business banking group. Now in incubation, the project is a big bet for 2014, she says.

Not every project makes it to the finish line, and that's OK with Shivanandan. "A failure is sometimes the biggest success because you didn't spend $10 million finding out that it didn't work," says Shivanandan.

That's also one of the biggest challenges of leading an innovation team, she adds. "If you get one out of a thousand ideas implemented, that's a good rate. Just make sure that people on the team understand that not everything is going to be implemented, and that's OK. We've learned from that, but the individuals sometimes don't feel that way."

A failure is sometimes the biggest success because you didn't spend $10 million finding out that it didn't work.

MONIQUE SHIVANANDAN, SVP AND CTO, CAPITAL ONE

A Second Life

Sometimes projects fail fast and then sit on a shelf until technology catches up to the idea. For instance, in late 2008, Hertz tried to launch car rental kiosks similar to those used by airlines. "It failed pretty fast," Eckroth recalls. "Our process is so much more cumbersome than just checking in for your boarding pass and picking a seat. There are so many added things we want to sell, so it really didn't take off."

Hertz scrapped the kiosks by early 2009. Fast-forward to 2010, when an IT employee learned about a company that developed video integration technology. Team members surmised that if they used the new technology and worked with their key suppliers to put it together, they could create a more interactive, personalized kiosk that would solve the problems they encountered with the basic kiosk technology.

The new kiosks have two interactive video screens. When a customer picks up a receiver, a centralized customer service rep pops up and can complete the entire rental transaction remotely. The rep can even suggest optional services, print the rental agreement and give

Speed of thought and speed to market are absolutely critical for us to keep our lead. If we stop, we're dead.

JOSEPH ECKROTH,
CIO, HERTZ

customers access to their car keys in a safe — 24 hours a day.

In 2011, Hertz's new ExpressRent kiosks hit major airports and have since catapulted the company into new markets. "This has been a real game-changer," Eckroth says. "We have reduced line waits in most of our major airports and shaved peak staffing requirements. We can serve markets we weren't able to serve before — we now have these [kiosks and rental cars] at hotels, body shops and parking garages in New York City."

A Method to Their Madness

Though ideas may run wild during brainstorming sessions, the process of refining a great idea into a workable plan usually includes a defined methodology.

Each quarter, the innovation management team at Steelcase, a workplace furnishings and services provider in Grand Rapids, Mich., convenes an innovation meeting with representatives of all areas of the business. The Innovation Management Office leader, who reports to the CIO, poses a single question to the group, such as "How do we create more efficiency in our manufacturing process?" He then uses a methodology developed by Palo Alto design firm IDEO to guide team members toward new ideas.

The methodology is the company's secret sauce for experimentation, says CIO Bob Krestakos. "IDEO is kind of our mentor in terms of design thinking methodologies," he says. "That methodology is applied to various areas of the business. It creates some of the ideas that we follow up on."

IDEO's philosophy is that virtually everyone has the capacity to innovate, but over time, people tend to lose their belief in their own creativity. Techniques such as defining problems through direct observation, developing empathy, encouraging people to come up with many ideas quickly, and fostering collaboration among colleagues with radically different viewpoints all help people regain their creative confidence.

The group comes up with three to five projects that they will work on for three to five months, depending on the experiment's complexity and promise.

The company recently found success experimenting with RFID technology as a way to improve its lean manufacturing model, says Krestakos. As the first deployment of the technology rolls out in North America, the company is developing prototypes of other RFID-based systems in an effort to find more applications. "It has really snowballed into something that I think can be really significant," he adds.

But Krestakos says it's important to balance innovation projects and other IT responsibilities. Otherwise, resource constraints on either end can cause conflicts.

"IT organizations have their own projects, commitments and timetables, and innovation can sometimes be seen as a distraction," Krestakos explains. "So we don't want to have too many things in flight from an innovation standpoint, but enough to keep us busy and thinking about what's possible."

In many cases, partners can help organizations bridge resource gaps. For example, Steelcase often enlists the MIT Media Lab and its more than 140 master's degree and Ph.D. student researchers to harness "outside thinking" and help Steelcase formulate hypotheses and conduct research that goes along with an idea, Krestakos adds.

Still, all Steelcase employees have the opportunity to come up with ideas and participate in experiments if they wish, and their enthusiasm for innovation work continues to grow.

"It's starting to feel like [innovation] is not just centered in one part of the organization. Anyone can participate," Krestakos says. "I think that's critically important to [building] optimism inside the organization."

For its part, Hertz seeks innovative ideas from all corners of the organization as a way to stay ahead in the rental car race. "We're making some big bets [on innovation], and that's exciting," Eckroth says. "If you're not willing to do that, you have to be willing to become a commodity and run in second or third place." ◆

Collett *is a* Computerworld *contributing writer. You can contact her at stcollett@comcast.net.*

SHOW ME THE MONEY

IT departments are developing creative ways to fund innovation projects — from both inside and outside the company.

For instance, at Hyatt Hotels and Resorts, depending on the scope of the project, "we either get some funding from the hotel [where the project takes place] or we take corporate dollars and invest in those properties," says John Prusnick, director of IT innovation and strategy. The hotels are corporate-owned, "so we're not taking particular interest in an individual owner or franchise," he adds.

The hotel chain also works with third-party IT partners that "sometimes have brilliant ideas and wish to try them out," Prusnick says. "We give them a venue and opportunity to [try out new ideas], and they help to fund some of that effort."

— STACY COLLETT

THINKSTOCK

BIG DATA, Big Jobs?

A slew of new jobs IS EXPECTED TO OPEN UP IN BIG DATA, BUT *not everyone in IT will qualify.* HERE'S WHAT EMPLOYERS WILL BE LOOKING FOR.

BY TAM HARBERT

AS BIG DATA GATHERS MOMENTUM, it's helping to create big career opportunities for IT professionals — if they have the right qualifications.

According to a report published in 2011 by McKinsey & Co., the U.S. could face a shortage by 2018 of 140,000 to 190,000 people with "deep analytical talent" and of 1.5 million people capable of analyzing data in ways that enable business decisions.

Companies are, and will continue to be, looking for employees with a complex set of skills to tap big data's promise of competitive advantage, market watchers say. "There's no question that the No. 1 requirement [for] enterprises that are serious about gaining a competitive advantage using data and analytics is going to be the talent to run that program," says Jack Phillips, CEO of the International Institute for Analytics (IIA), a research firm.

But what exactly constitutes "big data talent"? What are these jobs, and what skills do they require? What kind of background qualifies a person for a big data job? *Computerworld* took the pulse of some prominent players in the emerging field to determine an IT worker's place — if any — in the big data universe. Here's what they had to say.

Buckets of Skills

"There is no monolithic 'big data profession,' " says Sandeep Sacheti, former head of business risk and analytics at UBS Wealth Management, who now holds the newly created position of vice president of customer insights and operational excellence at Wolters Kluwer Corporate Legal Services.

[People who work in big data] have to be comfortable with ambiguity.

D.J. PATIL, DATA SCIENTIST, GREYLOCK PARTNERS

Sacheti's new job is all about big data: using analytics to understand customers, develop new products and cut operational costs. In one project, the Wolters division that sells electronic billing services to law firms is using analytics to mine data it gathers from its customers (with their permission) to create new products, including the Real Rate Report, which benchmarks law firm rates around the country.

Sacheti is now both hiring from the outside and training internal staffers for big data work. He thinks of big data jobs in terms of four "buckets of skill sets": data scientist, data architect, data visualizer and data change agent.

But there are no standard titles — other employers likely use different buckets and value different skills. What one company calls a data analyst, for example, might be called something different elsewhere, says John Reed, senior executive director at IT staffing firm Robert Half Technology. And, as Sacheti's title demonstrates, some big data jobs contain neither the word *big* nor the word *data*.

Some companies come to the IIA for help recruiting big-data talent, Phillips says. First they ask where to look for candidates. "Then they stop in their tracks and say, 'Wait, how do I know what I'm looking for?' " he adds.

"Everybody's asking, 'How do you identify these people? What skills do you look for? What is their degree?' " says Greta Roberts, CEO of Talent Analytics, which makes software designed to help employers correlate employees' skills and innate characteristics to business performance.

Roberts, Phillips and other experts say the skills most often mentioned in connection with big data jobs include math, statistics, data analysis, business analytics and even natural language processing. And although titles aren't always consistent from employer to employer, some, such as data scientist and data architect, are becoming more common.

A Curious Mind Is Key

As companies search for big data talent, they're tending to target application developers and software engineers more than IT operations professionals, says Josh Wills, senior director of data science at Cloudera, which sells and supports a commercial version of the open-source Hadoop framework for managing big data.

That's not to say IT operations specialists aren't needed in big data. After all, they build the infrastructure and support the big data systems.

"This is where the Hadoop guys come in," says D.J. Patil, data scientist in residence at Greylock Partners, a venture capital firm. "Without these guys, you can't do anything. They are building incredible infrastructure, but they are not necessarily doing the analysis."

IT staffers can quickly learn Hadoop through traditional classes or by teaching themselves, he notes. Burgeoning training programs at the major Hadoop vendors are proof that many IT folks are doing so.

That said, most of the jobs emerging in big data require knowledge of programming and the ability to develop applications, as well as an understanding of how to meet business needs.

The most important qualifications for these positions aren't academic degrees, certifications, job experience or titles. Rather, they seem to be soft skills: a curious mind, the ability to communicate with nontechnical people, a persistent — even stubborn — character and a strong creative bent.

Patil has a Ph.D. in applied mathematics. Sacheti has a Ph.D. in agricultural and resource economics. According to Patil, the qualities of curiosity and creativity matter more than one's field of study or level of academic credential.

"These are people who fit at the intersection of multiple domains," he says. "They have to take ideas from one field and apply them to another field, and they have to be comfortable with ambiguity."

Wills, for example, took a circuitous path to the role of data scientist. After graduating from Duke University with a bachelor's degree in math, he pursued a graduate degree in operations research at the University of Texas on and off while working for a

Jared Morgan
VICE PRESIDENT OF
BRADSHAW & WEIL, INC.

The Dependable Choice

Deploying online productivity software from Microsoft has empowered Bradshaw & Weil to get more done with less effort.

Founded in 1867, Bradshaw & Weil is an independent insurance agency offering a wide range of business, personal, and specialized policies. In this Q&A, company vice president Jared Morgan explains how aging, unreliable hardware ultimately led Bradshaw & Weil to adopt online productivity software from Microsoft.

Who's responsible for IT at your company?
I am. In addition to working with clients I'm also the company's CTO.

What led you to try an online productivity solution?
First our server crashed, putting us out of commission for three days. Then two of our workstations went down too, and we lost a lot of emails and contact information. We realized that online software would better protect our data and spare us from hardware failures. There was a lot of buzz about Google Apps at the time, it was free, and they told us we could continue using Microsoft Outlook, which is a familiar environment for our employees. So we decided to try it.

What kind of problems did you run into?
First off, it was nearly impossible to get everything working in Outlook the way it did before. You were supposed to organize email with labels instead of folders, and if you applied three labels to one email it showed up in three different places within Outlook. We had similar problems with calendars and contacts. Everyone was confused and upset, which hurt productivity.

Worse yet, we couldn't get any support, possibly because we were using free software. I left messages requesting help or information multiple times and got absolutely no response. We were completely on our own, and it ate up a lot of our time.

What led you to switch to Microsoft's online solution?
Once we realized that the "free" system we were using was actually costing us a lot of time, money, and productivity, we started investigating paid options. Microsoft's solution comes with Exchange, which I really like, and it integrates seamlessly with Outlook. We also knew that Microsoft would provide great support.

How did the deployment process go?
It was painless. With the prior system, setting up a workstation took me about 60 minutes. With the Microsoft solution, it was more like 20. Also, I experienced a minor technical glitch at one point and was absolutely blown away by how quickly Microsoft's support team helped me fix the problem.

What benefits have you realized since switching to Microsoft's online solution?
For starters, everyone is more productive. That's partly because Outlook works the way it's supposed to again and partly because we now have all of these great new tools for videoconferencing and instant messaging. SharePoint has really helped us streamline workflows, strengthen collaboration, and organize our documents too, and I like knowing that our files are stored safely in the cloud rather than on a server or laptop that could break or get stolen.

As for me, I'm spending two days a week that I previously dedicated to tech support on closing business instead. Even better, we now invest most of our IT budget in new systems and capabilities rather than maintenance. The money we used to spend keeping our server running, for example, now pays for a faster Internet connection that makes us more competitive. That's the kind of return on IT investment our CEO really likes!

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Big Data Skills & Titles

WITHOUT CONVENTIONAL TITLES, or even standard qualifications, it's hard to know what makes someone suitable for a big data job. This listing, based on interviews with big data experts and recruiters, attempts to match up some of the most common titles with the skills required.

■ **DATA SCIENTISTS:** **The top dogs in big data. This role is probably closest to what a 2011 McKinsey report calls "deep analytical talent."** Some companies are creating high-level management positions for data scientists. Many of these people have backgrounds in math or traditional statistics. Some have experience or degrees in artificial intelligence, natural language processing or data management.

■ **DATA ARCHITECTS:** **Programmers who are good at working with messy data, disparate types of data, undefined data and lots of ambiguity.** They may be people with traditional programming or business intelligence backgrounds, and they're often familiar with statistics. They need the creativity and persistence to be able to harness data in new ways to create new insights.

■ **DATA VISUALIZERS:** **Technologists who translate analytics into information a business can use.** They harness the data and put it in context, in layman's language, exploring what the data means and how it will impact the company. They need to be able to understand and communicate with all parts of the business, including C-level executives.

■ **DATA CHANGE AGENTS:** **People who drive changes in internal operations and processes based on data analytics.** They may come from a Six Sigma background, but they also need the communication skills to translate jargon into terms others can understand.

■ **DATA ENGINEERS/OPERATORS:** **The designers, builders and managers of the big data infrastructure.** They develop the architecture that helps analyze and process data in the way the business needs it. And they make sure those systems are performing smoothly.

"The people who do the best are those that have an intense curiosity," says D.J. Patil, data scientist in residence at Greylock Partners. Patil probably knows what he's talking about: *Forbes* magazine credits him and Cloudera founder Jeff Hammerbacher with coining the term data scientist. And earlier in his career, Patil helped develop the data science team and strategy at LinkedIn.

– TAM HARBERT

series of companies before dropping out to take a job at Google in 2007. (He notes that he did eventually complete that master's degree.) Wills worked at Google as a statistician and then as a software engineer before moving to Cloudera and assuming his data science title.

In short, big data folks seem to be jacks of all trades and masters of none, and their greatest skill may be the ability to serve as the "glue" in an organization, says Wills. "You can take someone who maybe is not the world's greatest software engineer [nor] the world's greatest statistician, but they have the communications skills to talk to people on both sides" as well as to the marketing team and C-level executives, he explains.

"These are people who cut across IT, software development, app development and analytics," Wills adds, noting that he thinks such professionals are rising in prominence. "I'm seeing a shift in value that companies are assigning to these people," he says.

Sacheti, too, keeps his eye out for people like that. "We are finding there are a lot more who are flexible in learning new skills, willing to do iterative design and agile thinking," he says.

Roberts agrees. "The innate characteristics of people, like a predisposition to curiosity, can be more predictive of someone's performance in a role than them having a degree in, say, IT or IS or CS," she says.

Wanted: Relentless, Scientific Temperament

Until recently, creativity, curiosity and communications skills haven't typically been emphasized in IT departments, which may be why many employers aren't looking to their IT operations staffs to find people to spearhead big data projects.

The IIA sees data science as resting on three legs: technological (IT, systems, hardware and software),

When we talk about data science, it's really an experiment-driven process. . . . You have to be OK with failure in a pretty big way.

JOSH WILLS, SENIOR DIRECTOR OF DATA SCIENCE, CLOUDERA

quantitative (statistics, math, modeling and algorithms) and business (domain knowledge), according to Phillips. "The professionals we see who are successful come from the quantitative side," he says. "They know about the technology, but they aren't running the technology. They rely on IT to give them the tools."

Big data also demands a scientific temperament, says Wills. "When we talk about data science, it's really an experiment-driven process," he explains. "You're usually trying lots of different things, and you have to be OK with failure in a pretty big way." Wills goes on to say that there's a "certain kind of relentlessness you need in the personality of someone who does this kind of work."

Big data professionals also have to be intellectually flexible enough to quickly change their assumptions and approaches to problems, says Brian Hopkins, an analyst at Forrester Research. "You can't limit yourself to one schema but [need to be comfortable] operating in an environment with multiple schemas or even no schemas," he says.

That tends to be a different approach than most IT people are used to. "IT people coming out of a strong enterprise IT shop are going to perhaps be constrained a little bit in their ability to do things quickly and move fast and be agile," Hopkins says.

But once hiring managers find the right type of person, they're usually willing to retrain that person to fill a big data role. For example, Patil used to work at LinkedIn, where, he says, "we largely trained ourselves, because so much of this is open source." He thinks the same thing can happen at most companies. "You can make these people" — if they have the right personality, he says.

IT workers who are flexible, willing to learn new tools and have a bit of an artist somewhere within can move into data architecture or even data visualization, says Sacheti.

In short, big data carries big potential for IT pros who would relish an opportunity to show their creativity. ◆

Frequent Computerworld *contributor* **Tam Harbert** *is a Washington, D.C.-based writer specializing in technology, business and public policy.*

DISASTER RECOVERY: Don't Forget Mobile

As the mobile workforce continues to grow, **IT execs must remember an important new piece of their disaster recovery plans:** mobile devices.

BY MARY K. PRATT

SAP HAD TWO PRIORITIES WHEN the earthquake and tsunami hit Japan in 2011: Contact its 1,000 employees there and ascertain their needs.

Given the sheer scope of the devastation, and the subsequent nuclear crisis, the task would seem herculean. But SAP leaders quickly connected with their Japan-based workers, most of whom had mobile devices, either company-issued or their own.

The next step, says SAP executive vice president and CIO Oliver Bussmann, was getting back to work, even though the company had to temporarily close its Tokyo office. With redundant systems and its global reach, SAP was able to shift some workload out of Japan while its employees there were able to use their smartphones, tablets and laptops to access corporate assets.

"There's much more potential out there from a disaster-recovery perspective," Bussmann says, noting that SAP in the past two years has more deeply incorporated mobile devices into its disaster-recovery and business continuity plans.

CIOs like Bussmann are increasingly considering how mobile capabilities can help their companies get through catastrophes. In the 2012 AT&T Business Continuity Study, 67% of the 504 U.S.-based IT executives surveyed said that they include wireless network capabilities in their business continuity plans.

Despite that high percentage, though, the effectiveness of those plans varies widely, IT leaders and consultants say. Organizations using mobile devices for everyday tasks are more likely to have plans to use them in disasters, while those that don't are less able to rely on them in crisis situations.

However, as more people use smartphones and tablets to do their jobs, CIOs will have no choice but to figure out how to effectively fit mobile into their disaster-recovery plans. To do that, they must consider what data — if any — is stored on the devices, how workers access corporate systems on a regular basis as well as during a crisis, and what barriers they would encounter during any sort of incident.

That, in short, means analyzing the opportunities and challenges related to such a strategy.

"The more mobile you can make your workforce, the better off you'll be, so it's certainly a tool CIOs need to think about from a business continuity perspective," says Michael Porier, the Houston-based managing director of consulting firm Protiviti.

Companies are incorporating mobility into their emergency plans in part so they'll be able to send out blast messages via email, text and voice — an approach that increases the odds that at least one

type of message will get through, Porier says. Companies often use such blasts to check on workers who are in harm's way and to provide information on safety programs and work processes.

From there, he says CIOs are determining which employees can use their mobile devices for work during an incident and how that will happen. Porier says IT leaders need to have security measures in place, whether that's mobile device management software to secure, monitor, manage and support the devices or some other process that protects corporate data. And they need to determine whether to allow employees to download data to their devices or require them to access it through secure channels, such as a VPN.

Ray Thomas, a senior associate who oversees business assurance at consulting firm Booz Allen Hamilton, says he and his colleagues have been weighing such issues in recent years as the firm has endeavored to make its workforce more mobile. "We've been building mobility into how people work on a day-to-day basis, and that same flexibility works to our advantage during a disaster. As long as there's connectivity, our employees can continue to be productive," Thomas says.

Booz Allen has a notification system that uses email, voice and text messaging to push out messages that workers can access via smartphones or tablets. Employees can also access the corporate network with smartphones, tablets, laptops and personal desktop PCs.

Meanwhile, Thomas says employees routinely download work files onto their laptops, and they're reminded to plan to take work home on their devices in advance of expected events, such as Hurricane Sandy, so they can work even if connections with the corporate network are sketchy.

But that approach underscores the limits of a policy that relies on mobile devices during disasters: Power, connectivity and access to corporate networks are no guarantee. "There are weak links all over," says Gregg "Skip" Bailey, director of technology, strategy and architecture at Deloitte Consulting.

He points out that when a magnitude 5.8 earthquake hit the Washington, D.C., area in 2011, cellular networks were overloaded, and many people couldn't make or receive calls, although some texts were able to slowly make it through. And Hurricane Sandy took out some cell services completely and left many areas without the power needed to recharge devices.

Companies with workers accessing the corporate network from handheld devices also need to consider whether they can accommodate added network traffic during an emergency, says Joe Nocera, principal in PwC's Advisory Technology Consulting practice. He says a typical VPN might be used by 20% to 25% of a company's employees on a daily basis, but usage can spike to more than 80% during a disaster.

Moreover, Bailey and others say, workers have to be accustomed to using smartphones and tablets for daily tasks before a disaster strikes. Executives shouldn't assume that workers will be able to easily switch from their regular desktop habits to working on their handhelds. Nor should they expect workers to learn on the fly how to use a VPN to access corporate systems from their home computers. And even if they could, let's face it: Working on a smartphone or tablet doesn't match the ease of working with a desktop's full-size keyboard and screen.

Of course, all this talk presupposes that corporate systems will remain up and running during a disaster. If they don't, that's a whole other ballgame.

"If you have a data center that gets wiped out, it doesn't matter if you have mobile devices," Bailey says.

With that in mind, IT needs to understand the role mobility plays in keeping a business running as it plans its back-end recovery efforts, making it a priority to restore the servers that support mobile device management and applications that enable mobility, Nocera says.

"It's knowing where those applications are being served up and making sure you have them covered in your recovery plan," he says.

> **We've been building mobility into how people work on a day-to-day basis,** and that same flexibility works to our advantage during a disaster.
>
> **RAY THOMAS,** SENIOR ASSOCIATE, BOOZ ALLEN HAMILTON

More CIOs are bumping that up the priority list.

Buddy Cox, executive vice president and CIO at Houston-based Cadence Bancorp, is seeing that firsthand. According to industry statistics, 18 million people bank via mobile devices today, and that figure is expected to grow to 50 million by 2015. Faced with those kinds of figures, along with workers' changing work styles, he says he's enabling more mobile devices to handle a growing number of mission-critical applications.

"We looked at what our customers and [employees] need to access in an event, from minor interruptions to catastrophic ones. And we know who carries iPads or iPhones and what options we have," he says, explaining that his disaster-recovery plans also include regional recovery sites where employees can work. Those sites even have satellite-based communications systems.

But, for now, experts agree: Mobile isn't a panacea, but rather one piece of what should be a multilayered approach that also includes land-based connections, alternative office sites and some redundant systems.

"We haven't gotten to the state where [we can] just fail over to mobile devices," says Dan Waddell, senior director of IT security at eGlobalTech, an IT consultancy in Arlington, Va., and a member of the board of the International Information Systems Security Certification Consortium. "They should be considered, but they should not be the only option." ◆

Pratt *is a* Computerworld *contributing writer in Waltham, Mass. Contact her at marykpratt@verizon.net.*

Security Manager's Journal

MATHIAS THURMAN

When Technologies Collide

An encryption initiative runs into the law of unintended consequences: Legal can't search encrypted emails.

MY EFFORTS to protect sensitive company data recently got a boost when we introduced encryption for files and emails to several key groups, including the human resources, finance, sales and legal departments. I was delighted to see how readily many employees in those groups were adopting encryption, since its use means that files and email can be read only by the intended recipients. Then we ran smack into the law of unintended consequences.

A couple of years ago, we purchased an email archiving tool that automatically stores copies of all sent and received email, which was something that our legal department was interested in doing as a way to help it comply with e-discovery requirements. Now, whenever we are faced with an e-discovery request, whether it relates to an HR matter or a court case, we can run fast, efficient and detailed searches against the entire email repository.

Or rather, we could do that, until we started encrypting some of our email.

Last week, as it was looking into an issue involving license compliance, the legal department asked me to conduct a search of the archive for emails containing certain keywords. You see, the licensing model for some of our products hasn't been updated in years and therefore our licenses can be misused. Our sales contracts include language giving us the right to audit customers to ensure that they are using our products within the constraints of the license they paid for. Many times, we have to enter into litigation with our customers, some of whom then claim that our sales associates gave them permission to use the license in a way that violates the agreement. The value at issue in such disputes can rise to over a million dollars, so it's critical for us to have the ability to search our archives for keywords within the body of emails that would bolster our contention that no such promises were made.

But when an email is encrypted, we can't search it. That's why I was sitting in our general counsel's office today, explaining that our new encryption initiative was the likely reason we were unable to find emails beneficial to our company in this particular compliance investigation.

We decided that we were going to have to step back from encryption for now while we look for a way to decrypt email messages before they are copied to the archive tool. I'm in full agreement with that decision, but it doesn't make me happy. That's because the pilot deployment had been going well, and now we have to push a new policy to our clients, remove the email encryption option and communicate the reasoning to current users. This turn of events doesn't make us look terribly competent.

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> **We decided that we were going to have to step back from encryption for now.**

Trouble Ticket

At issue: Encrypted emails can't be searched in the archive for e-discovery purposes.

Action plan: Pull the plug on the encryption deployment until the conflict can be resolved.

Alternative Plans

But despite the awkwardness of the current predicament, I'm confident that we'll have things back on track soon enough.

Right now, I'm looking at deploying an email gateway that would allow employees to place an email into a secure location to be accessed by customers and partners. Those emails would be encrypted only in transit and as they sit on the gateway awaiting retrieval. Once the email is downloaded, the encryption isn't persistent. Email retrieval is typically through a Web browser, so users will have to take an extra step. The aborted encryption program was more seamless, but this will at least give our employees a way to communicate securely with customers, partners and other third parties.

For the long term, I will begin to work with our vendor on options that will allow us to decrypt email before it's copied to the archive or enable searching through encrypted emails. ◆

This week's journal is written by a real security manager, **"Mathias Thurman,"** *whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*

OPINION

S.J. VAUGHAN-NICHOLS

Vendors Just Can't Stop Trying to Lock Us All In

> We're heading to a new era of platform lock-in that extends to vendors' Internet services.

WHAT DO Apple's iOS, Microsoft's Windows 8 and Google's Android all have in common? None of them works that well without the Internet. This trend has been developing for years and is now accelerating.

Don't get me wrong. I love the Internet and I like operating systems, such as Google Chrome OS, that require it. But I like having true platform choice even more.

I was there for the PC revolution of the '70s and '80s, and I well remember how it undermined the ability of the IT department to control every last bit and byte. I don't want to go back to the days when users had no control — but I'm afraid that's exactly what's happening.

Today, it's the big vendors that are taking control. Using an iPhone or iPad locks you into the Apple ecosystem. Want to use Adobe Flash? Too bad. Steve Jobs decided he didn't want you to have it, and that was that.

It's not much different with other technology choices. From time to time, things might happen that give the impression that everyone is trying to get along. Google, for instance, has got its maps working on iOS devices again, something that also required the goodwill of the keepers of the Apple App Store. Meanwhile, though, Google has decided to pull the rug out from underneath Microsoft.

First, it announced that it won't release apps for Windows 8 or Windows Phone 8. Then, it said that it would no longer support Microsoft Exchange ActiveSync free of charge. The net effect of that second decision is to make email and calendering programs — not just for Windows, but also for iOS and Mac OS X — a lot less attractive to users who have committed themselves to Google's offerings for their back-end groupware services.

An Old Game

Microsoft, of course, has been playing this game since, well, pretty much forever. To take one recent example, when you first start running Windows 8 or RT, you're encouraged to set it up with a Microsoft account. It sounds great. "When you sign in with a Microsoft account," Microsoft tells you, "your PC is connected to the cloud, and many of the settings, preferences, and apps associated with your account can 'follow' you between different PCs."

Let's say you do that. What happens when you try to start your Windows 8 laptop somewhere without Internet access? You can't log in. Ain't that a kick in the head? You have to open a local account and then set everything else back to the way you like it.

In all of these developments, I see signs that we're heading to a new era of platform lock-in. Your choices will be Apple, Google, Microsoft and possibly Amazon. Each seeks to lock you in not just with its particular devices and applications, but also with Internet services that either aren't available on other platforms or are very inconvenient to use on other platforms.

Sure, vendor lock-in is nothing new, and I've bemoaned this new trend before, citing completely different developments. But let's not forget that "PC" stands for "personal computer." If a handful of top vendors are allowed to decide what Internet services we can and can't run, the "personal" in personal computing will go away. And we will have lost something important. ◆

Steven J. Vaughan-Nichols has been writing about technology and the business of technology since CP/M-80 was cutting-edge and 300bps was a fast Internet connection — and we liked it! He can be reached at sjvn@vna1.com.

Career Watch

ASK A PREMIER 100 IT LEADER

Chris Miller

The CIO at Avanade answers questions about **communicating with a global team** *and the viability of a continuing career in IT.*

I'm overseeing a global team right now. Naturally, communication is key. Do you have any advice on how to keep the lines of communication open and running well? Treating team members equally regardless of physical location and holding all employees to the same expectations and standards are key to building a high-performing global team.

Working across time zones can be especially difficult, but sharing the burden of inconvenient meeting times across the team will go a long way toward showing that you understand the challenges. Also, taking the time to interact informally and socially with remote co-workers just as you would with someone in the cubicle or office next to you can strengthen connections with your team members.

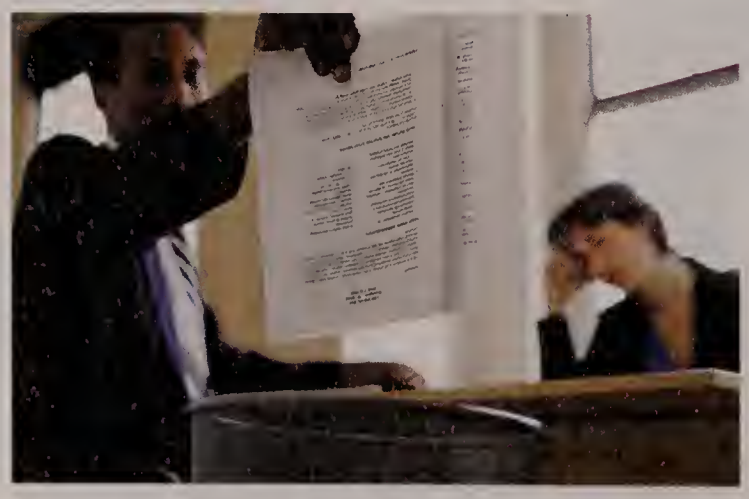
Our team uses enterprise collaboration tools to stay in touch. We have a platform that takes advantage of technologies like social networking, unified communications and videoconferencing to foster collaboration and knowledge sharing. While the technologies used to enable such interactions may differ from company to company, it's important to encourage a culture of collaboration. We have only 30% of our IT employees in our corporate headquarters, with a sizable offshore team and employees spread across Avanade's global locations, so our employees have had to find ways to work effectively as a global team. I also believe that it's hard to replace in-person meetings, so I encourage our leadership team to visit our locations every 12 to 18 months.

I was laid off with hundreds of others about 14 months ago, and so far I've had no luck getting another network admin job. I'm willing and able to do other things in IT, but after so much time, I wonder whether I should just try something else. Still, it's technology that I really love. Would it be a mistake to give it all up? I believe this is a great time to be in the technology field, and well-qualified IT professionals are in high demand in many areas. Though each market is unique, overall tech-sector unemployment is lower than the national average, and with continued focus on innovation and enabling technology, that's unlikely to change soon. In any event, I would encourage you to follow your passion. Having a job you love leads to a better sense of balance, and to success in all areas of your life. Best wishes in your search.

If you have a question for one of our Premier 100 IT Leaders, send it to **askaleader@computerworld.com,** and watch for this column each month.

Things Recruiters Don't Like

APPLYING FOR A JOB that you're not remotely qualified for can't do you any harm, right? Wrong. It can actually hurt your chances of getting a job for which you're a good fit, according to a survey of 1,500 recruiters and hiring managers conducted by Bullhorn, a Boston-based company that provides hosted staffing software to recruiting firms. Respondents were asked to rank negative behaviors that job seekers engage in, and applying for a job that's out of your league was the faux pas deemed most inappropriate by the largest percentage of respondents (30%). Many others ranked that indiscretion near the top, and 43% said they would blacklist such job seekers by suppressing their names in résumé searches.



Here are some of the other behaviors that ranked among the worst:

- **Exaggerating qualifications.**
- **Focusing on salary above all other factors.**
- **Responding to a posting for a job that requires much more experience than you have.**
- **Calling or emailing more than once a week to ask for updates.**

When asked which attributes would differentiate job applicants with similar backgrounds and qualifications, 57% of the respondents cited the way a candidate's personality fit with the hiring company. And while 32% of the respondents said that the names of previous employers could set an individual apart, fewer than 4% said that "the name of the school they attended" would help truly differentiate a candidate.

THINKSTOCK

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:

Program Manager (Mountain View, CA) **#1615.5218**; Manage regional and global technology programs for Google. Exp incl: process data sets at scale programmatically using SQL, Python, PHP, &/or Jscript; dvlpmnt of automated reports & dashboards highlighting perf aspects of assigned proj for co mgrs & execs; & large scale internet consumer appl. Srv millions of cust/day

Webmaster (Mountain View,CA) **#1615.2035**; Design, develop, modify, and/or test Google's web-based systems, architecture, and related features. Exp incl: Python; HTTP & web tech; web appl & web srvcs; NoSQL, HTML, CSS, JSON, or Jscript; App Engine; content mgmnt syst &/or web site production; bash; & internationalization & bldng right-to-left lang designs, websites, & tools.

SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:

#1615.1041; Java & Linux; Jscript; SQL; oo analysis & design patterns; web appl & multi-tiered syst; mach learn; & mobile appl dvlpmnt.

#1615.1040; distrib syst, oo prog; Jscript; CSS; ntwrk tech stack; & UNIX.

#1615.5288; C, C++, &/or Java; large syst sw design & dvlpmnt; Unix or Linux; data struct, algorithms, & sw design; Jscript or AJAX; database design & SQL; TCP & IP or ntwrk prog; multithread prog; & PHP, Perl, or Shell.

#1615.3462; sw dvlpmnt; Java; data struct; algorithms; C; C++; & large syst sw design.

#1615.3426; Java, oo prog, Java EE, & design patterns; UI design & implement, distrib web appl & scalable multi-tiered syst, & Linux; manage lifecycle of prod from reqmnts to user adoption; & code quality/test automation.

#1615.3870; algorithm design & complex analysis incl dynamic prog, probability theory, data struct, & string algorithms; & coding in C++, STL, Jscript, Python, & Java.

#1615.2427; sw dvlpmnt; web dvlpmnt; Java prog; UNIX; Jscript, HTML, CSS, DOM manipulation, & MVC dvlpmnt frmwrk incl HTML5 & CSS3; cross-browser pltfrms; design clean & robust APIs; & closure library.

#1615.3929; C, C++, or Java; Python, Perl, Shell, &/or PHP; data struct, algorithms & complexity analysis; analyze & troubleshoot large-scale distrib syst; high-vol or critical prod srvc environ; IP ntwrkng, ntwrk analysis, & perf analysis; & appl issues using standard tools.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:

Site Reliability Engineer Positions (NY, NY) Provide technical support necessary to ensure full availability of Google online services. Exp incl:

#1615.4219 C++ or Java; oo design; Perl & Shell; Unix & Linux oper syst; large-scale distrib syst, incl design & dvlpmnt; SQL & database design; relational & NoSQL databases; ntwrk prog & TCP/IP; & data struct & complex algorithms.

#1615.2455; Linux; op syst; syst analysis; design & build monitor syst; TCP/IP; & troubleshoot mission critical syst.

SW Eng Position (NY, NY): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:

#1615.3156 C Linux kernel; multi-thread prog; TCP/IP ntwrkng internals; dvlpmnt of oper syst ntwrk stacks; large scale distrib syst or concurrent syst; optimize; data struct; algorithms; & sw design.

#1615.3688 dvlpmnt of tools or svcs for use by other eng; oo prog; Java or C#; algorithms; & sw dvlpmnt lifecycle.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:

Software Engineer Position (San Francisco, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. Incl.:

#1615.3942; C & C++; Java; Python; internet protocols, specifically HTTP & Mail; HTML; distrib syst; algorithm analysis; dynamic prog; hashing; & concurrency.

#1615.3313; Java, C++ & Python; dvlpmnt of usability solutions; back-end dvlpmnt in AppEngine; front-end dvlpmnt for both web & mobile; prod design for Internet & mobile; large-scale distrib syst at global scale; dvlpmnt of large-scale tools for content ingestion; create scalable backend syst; mobile dvlpmnt, incl Android & iOS; mobile appl w/an emphasis on map geographic prog; & prog in numerous industry standards.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below: Strategist Google Apps (Austin, TX) **#1615.1985** Strategize improvements to Google Apps products to further their distribution and usage by Google customers. Exp incl: high-level troubleshoot of customer ntwrks; web techn, incl at least two of the following (HTML, XML, XSLT, CGI, Jscript, HTTP protocols, & web srvrs); enterprise technical arch components, incl at least two of the following (content mgmnt syst, databases, SSO, & ntwrk arch); & isolation of technical issues & gather working reqmnts.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:

Test Engineer (Mountain View, CA) **#1615.2488** Design, develop, modify, and/or test software needed for various internet search engine company projects. Exp incl: debug; exec of test efforts, incl automated web test; & Java & Python.

Hardware Engineer (Mountain View, CA) **#1615.4781** Design, develop, modify, and/or test hardware needed for various Google projects. Exp incl: optic microscopy, X-Ray, read reports using SEM/EDS, FTIR, & XPS for figure analysis; failure analysis method; industry test standards incl JEDEC, ASTM, & IEEE; FMEA; reliability test incl, Mech Stress Tests, Shock/Drop/Vibration Tests, & Environ Tests; & technical analysis, Weibull++, and JMP. Up to 20% trvl req'd.

SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:

#1615.231 mach learn; parallel & distrib compute; core Android OS internals; Apple IOS dvlpmnt; Java, Python, &/or Jscript; multithread prog; & server, database & info retrieval syst.

#1615.484 C or C++; multithread & Python; ntwrk security & authenticate; vulnerability research & reverse eng'g; static analysis & x86 & x64 assembly & vulnerability mitigations.

#1615.3366 C/C++, Python,& Java; Unix & Linux; & multithread, oper syst, & comp ntwrks.

#1615.4643 Java &/or Python; Unix &/or Linux; data struct, algorithms, & sw design; & TCP/IP &/or ntwrk prog.

#1615.4097 large scale sw syst; oo prog; data mine techniques; & mach learn algorithms.

#1615.1208 comp graphics or GPU comp appl; Direct3D & OpenGL; embed syst; linear algebra & 3D geometry.

#1615.948 C++, Jscript, & CSS; implement & design of syst in oo lang; front-end dvlpmnt; data mine; & stat analysis.

#1615.3893 classical & modern stat ,models & methods & applicable techniques; design & implement large scale distrib process; analysis of large data of user behavior; & dvlpmnt, test, & enhance prod & syst utilities.

Sr. Oracle Applications Developer (New York, NY opening. Travel not required, but candidates must be willing to relocate to unanticipated locations across the country per contract demand): Develop/implement Oracle Applications using OA Framework for Advanced Procurement Suite. Email resume to Vice President, Vypak Corporation at Richard@vypak.com

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:

Industrial Designer (Mountain View, CA) **#1615.4800** Define the user model and user interface for new and existing Google products and features. Exp incl: product or automotive concept dvlpmnt; design prototypes; define ID, product UX & CMF; & manufacture design.

Network Capacity Planner (Mountain View, CA); **#1615.3569** Adapt and enhance existing models which characterize architectural guidelines and design principles to affect network capacity decisions. Exp incl: ntwrk plan prob of complex scope on large scale srvc provider ntwrks; ntwrk model sw; stati data process with large and diverse data sets; demand model; Monte Carlo simulations; ntwrk model; perf metrics; Oper Research for ntwrk analysis; ntwrk protocols & design principles; & prog skills in Matlab, Python, or C++.

Technical Program Manager (Mountain View, CA) **#1615.5099** Coordinate regional and global technology programs for Google. Exp incl: data wrhse; script lang; oo lang; mgmnt of large-scale tech proj for complete life cycle; interact with diverse tech & non-tech groups, spanning all org levels; & bus intelligence.

SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:

#1615.3740 C++, Java, Python, &/or Go; large-scale distrib syst; design of fault tolerant & recovery syst; multi-thread prog; AI & mach learn; & perf analysis.

#1615.4468 data struct & algorithms; large-scale distrib syst; Java; appl prog interface design; Python, Perl, Shell, or PHP; SQL lang & SQL databases; NoSQL databases; & Extract, Transform, & Load process.

#1615.4470 Core Java, Jscript/DHTML & SQL prog; oo prog & design patterns incl GoF, J2EE, & EI; req analysis, tech design & re-eng'g; document using industry recognized methods; adv data struct, algorithms, complexity analysis & optimize; relational database design; large-scale distrib compute incl, multithread/distrib prog, organize & process large data vol, design & dvlp highly loaded, scalable & fault-tolerant srvcs both open & internal, message-oriented prog; & web dvlpmnt w/ Java Servlets & Dynamic HTML.

#1615.5195 C & C++; multithread; SQL; distrib & parallel compute; dynamic prog; mach learn; & algorithms.

#1615.3878 distrib syst; database & storage sys; ntwrkng; oper syst; security, reputation, & spam detection; & prog lang.

#1615.1193 C++ & STL; oo prog; multithread; Java; Jscript & HTML; Python; SQL; & parallel & distrib compute.

#1615.3714 large scale distrib syst perf & behavior; C++ prog; & maint of legacy codebases.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:

SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:

#1615.4036; C++, Java & Unix Shell Script; MySQL; oo program; highly scalable syst; & XML &/or HTML.

#1615.5324; dvlp & test prod &/or syst utilities; design, implement, test & maintain subsyst; oo prog; Jscript, SQL, Python & Linux; &HTML.

#1615.405; C++; algorithms; web tech, incl Jscript, HTML, & CSS; stat packages; data analysis, data mine & mach learn tech; info retrieval syst; & design large distrib syst.

#1615.2096; C & C++; large scale data syst; distrib SW design; data struct; algorithm analysis; databases; & computational complexity.

#1615.3695; distrib syst; mach learn; Java sw eng'g.

#1615.4476; C or C++; Java; multithread; Linux kernel internals; perf monitor & test IPN; ntwrk control plane syst, OpenFlow, & GRE; layer-2, layer-3, or layer-4 ntwrk protocols & technology; design of RESTful API; & design, implement, test, & maint of multi-component sw ntwrkng control.

#1615.4536: design & dvlpmnt of large scale oo syst; C++ or Java; multithread; adv algorithms & data struct; parallel prog; parallel & distrib syst; large scale data process using MapReduce; distrib web crawl syst; & info retrieval.

#1615.4954; Java; HTML & CSS; Jscript; REST; Linux; Perforce; parallel & distrib compute; design fault tolerant high perf large-scale distrib syst; dvlpmnt of sw pltfrms designed to plan optimal inventory positions in a supply chain pipeline & collect data in process to facilitate debug systems; improve existing algorithms or dvlpmnt of new algorithms; & dvlpmnt of sw syst that use BigData technologies to process & query multiple terabytes of data.

#1615.4970; dvlpmnt, test,& enhance prod &/or syst utilities; design, implement, test, & maint of moderate complex subsyst; data struct & algorithms; & Java, C++, or Python.

#1615.4123; C, C++ &/or Java; data struct, algorithms, & sw design; database design & SQL; TCP/IP &/or ntwrk prog; design, implement, test, & maint of moderate complex subsyst; Unix & Linux; & AJAX.

Sr Software Engineer:(Norwood MA) Master's + 4 months of exp(Comp Sci, Engg, Math, MIS, Buss.Admin or Science) Develop, create & modify general computer applications software or specialized utility programs. Analyze user needs & develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency.May analyze and design databases within an application area, working individually or coordinating database development as part of a team, Travel may be required.Apply with 2 copies of resume to HR, LanceSys Inc 1416 Boston Providence Tnpk Suite# 227, Norwood MA 02062

IT|careers

Senior Business Analyst (Helena, MT) Lead functional/technical development of retirement benefits IT project. Req BE or equiv degree in Engineering or MIS & 5-yr progressive exp w/public retirement domain IT projects as business analyst or SW devlt occupations related to the job. Exp should include MS.Net or J2EE, Rational Software Architect, MS Visio, SQL Queries, SQL Server. Send salary reqt & resume to: HR, Sagitec Solutions, 422 County Rd D East, Little Canada, MN 55117.

Weils Fargo has an opening for a Application Systems Engineer 4 in St. Louis, MO. Will act as a lead developer for software project & applic. systems support activities. Send resume to Kara Ayers at 1525 W WT Harris Blvd, MAC: D1114-015, Charlotte, NC 28262. Ref job code 20121012SV.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
SW Engineer Position (Venice, CA): Design, develop, modify, and/or test sw needed for various internet search engine co. projects. Exp incl:
#1615.3576, C, C++, Python, & Bash; sw eng'g & oo prog; large scale syst design; Linux; & data struct, algorithms, & sw design.
#1615.908; oo patterns for Java; web arch & protocols; HTML; Jscript; & CSS.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below.
SW Eng Position (Pittsburgh, PA): Design, develop, modify, and/or test sw needed for various internet search engine co. projects. Exp. include:

#1615.996; write sw; analyze large data sets for mach learn; analyze & improve existing mach learn algorithms; eval technical data; & design & implement solutions for large scale prob.

Senior Technology Architect (Business Intelligence) - US (Full-Time; Multiple Openings) - Infosys Limited is in need of Senior Technology Architect(s) (Business Intelligence) to work in Plano, Texas, and various unanticipated locations throughout the U.S, to provide architectural solutions for one or more projects. Provide input to create technology and architectural frameworks. Understand and analyze client business & IT problems, technology landscape, IT standards, and enterprise roadmaps. We are an Equal Opportunity Employer M/F/D/V. Please apply on-line at http://www.infosys.com/careers/apply-now/us-jobs.asp and search for the reference # Inf_EXTERNAL_59532991_2.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
SW Engineer Position (Venice, CA): Design, develop, modify, and/or test sw needed for various internet search engine co. projects. Exp incl:
#1615.3676 C++ & Python; multicore, concurrency, multithread, & synchronization; distrib syst & distrib compute frmwrks; info retrieval & data mining; oo analysis & design; Linux; & data model & stat analysis.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
SW Eng Position (Cambridge, MA): #1615.1830 Design, develop, modify, and/or test sw needed for various Google projects. Exp. include: Java web dvlpmnt; C; C++; dynamic lang; ant builds; client srvr technologies; & multi-pltfrm appl.

Research in Motion Corporation (US), San Diego, CA, positions are available:
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Research in Motion Corporation (US), Irving, TX, positions are available:
TX7037 – Interoperability Test Specialist
Research in Motion Corporation (US), Rolling Meadows , IL, positions are available:
IL7038 – Software Developer
Submit resume to Research in Motion Corporation (US), to P.O. Box 141394, Irving, TX, 75014-1394 U.S.A., referencing appropriate job title and requisition number.

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Software Engineer Positions: Design, develop, modify, and/or test sw needed for various Google projects. Exp. Incl.:

#1615.3787 (Kirkland, WA); algorithms, data struct, sw design patterns; design & dvlpmnt of frontend tech using Java, HTML, CSS, AJAX, & XML; web-appl backend tech, C++, multi-thread prog, perf monitor syst dvlpmnt; & web srvcs & appl servers.
#1615.4075 (Seattle, WA) C++ dvlpmnt; algorithms; & Unix or Linux environ.

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IT|careers

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Test Engineer (Mountain View, CA) **#1615.3142**; Design, develop, modify, and/or test software needed for various Google projects. Android & web appl test process; Android debug bridge, Monkey, Dalvik Debug Monitor Server memory profile test tools & test automation exec in real devices; localize pipeline & localize test tools; Apache JMeter load test tools; Selenium & WebDriver end-to-end test automation tools; continuous test; security test; frontend & backend infrastruct; & code resource mgmnt syst.
Business Systems Integrator (Mountain View, CA) **#1615.4854**; Design analytical solutions that answer complex bus decisions. implement & design of bus appl; relational databases; & SQL.
Software Engineer in Test Positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp incl:
#1615.3582; sw dvlpmnt; sw test & test automation; C++; Java; Python, Shell, TCL, or Perl; data struct & algorithms; oo design; sw test methodologies; & Linux.
#1615.3358; Java; Python; SQL; mach learn; Jscript; C; security dvlpmnt lifecycle.
#1615.896; C, C++, Java, or Python; Linux oper syst; mach learn; design & implement build & test infrastruct; design, implement, test, & maint of complex subsyst; comprehension & modify existing code base; & identification of relationships between parts of complex proj.
SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:
#1615.1101; ntwrk syst; L2 & L3 switch & stand ntwrk protocols; C++ & C prog; Shell script, incl Bash &/or Python; Linux or BSD kernel; multicore arch, synchronization, & parallel compute; embed syst; dvlpmnt of device drivers; & dvlpmnt of device & ntwrk mgmnt syst.
#1615.3605; oo design; mobile appl dvlpmnt; prog in Java, Python& Obj-C; Android or iOS; MVC appl design & reactive touch based UI; database design & SQL; 2D & 3D algebra; TCP & IP ntwrks & ntwrk security; & data struct & adv algorithms.
#1615.1786; analysis & optimize skills; data struct, algorithms, & sw design; & C.
#1615.2949; infrastruct dvlpmnt & sw arch for large scale distrib syst; QA& automated functional test; large-scale data analysis & infrastruct; Java dvlpmnt & oo tech; GWT, Jscript, or jQuery dvlpmnt; & HTML, CSS, & client-side infrastruct.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:

Web Developer (San Bruno, CA); **#1615.4763** Design, develop, modify, and/or test Google's web-based systems, architecture, and related features. Exp incl: large scale web sites; oo prog in primary dvlpmnt lang, incl Jscript, CSS, & HTML; exec environ, incl web browsers; Jscript library; unobtrusive Jscript & semantic HTML; Jscript & CSS compilation tools; web standards, incl HTML5 & CSS3; front-end security, latency, & cross-domain commun; browser & pltfrm differences; front-end integration issues; script lang; UNIX command-line tools; source control tools; nat applof design patterns to design new features; stand appl & ntwrk debug tools to diagnose & resolve prod issues; & usability & web design.
Software Engineer (San Bruno CA) **#1615.5298** Design, develop, modify, and/or test software needed for various Google projects. Exp incl: Unix or Linux syst; ActionScript 3; Jscript; ActionScript 2; Python; dvlpmnt of appl for embedded pltfrms w/ memory & processor resource constraints; dvlpmnt of appl for OEM frmwrks; & dvlpmnt of appl for OEM pltfrms, incl appl for SOC vendors.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
Software Engineer Positions: Design, develop, modify, and/or test sw needed for various Google projects. Exp. Incl.:

#1615.3377 (Kirkland, WA) oo prog & design; web dvlpmnt; database mgmnt; Java or C++; & troubleshoot sw.
#1615.5076 (Kirkland, WA) C++ compiler technologies; dvlpmnt, test,& enhance prod &/or svcs; & design, implement, test, & maint of complex subsyst.
#1615.4797; (Kirkland, WA) Perl, Java, C# or C++; oo prog; & AJAX, XML, HTML, Web Svcs Frmwrks & databases.
#1615.3823 (Seattle, WA) C, C++, or Java; cloud compute; multicore; multithread; parallel compute, distrib compute; profile, oper syst; & test methodology.
#1615.4882 (Seattle, WA) C, C++, or Java; oo technologies; algorithm dvlpmnt & implement; test methodology; distrib compute; & oper syst.

Wells Fargo has an opening for a Application Systems Engineer 5 in St. Louis, MO. Will act as a lead in providing applic. design guidance & consultation, utilizing a thorough understanding of applicable technology, tools and existing designs. Send resume to Kara Ayers at 1525 W WT Harris Blvd, MAC: D1114-015, Charlotte, NC 28262. Ref job code 20121130SS.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
Sales Operations Associate Lead (Mountain View, CA;) **#1615.5049**; Collaborate with multiple stakeholders across Google Enterprise to define and deliver insightful metrics, analyze data, and forecast sales. Exp incl: analysis & creation of reports w/Excel, database queries, stats & quantitative model, & forecast; front end tools; Jscript & Python; large, multiple datasets & data wrhses; data mine; business process improvement initiatives; & deck creation & presentation.
Site Reliability Engineer (Mountain View, CA) **#1615.3808**; Provide technical support necessary to ensure full availability of Google online services. Exp incl: C, C++ or Java; oper syst optimize; comp arch; Perl, Python or Ruby; distrib syst; & web appl.
Hardware Engineer (Mountain View, CA) **#1615.4269**; Design, develop, modify, and/or test hardware needed for various Google projects. Exp incl: tech leadership & troubleshoot hw dvlpmnt proj; prod dvlpmnt; & power design & distrib methodologies at board & syst level. Up to 10% trvl req'd.
Technical Program Manager; (Mountain View, CA) ; **#1615.4109**; Lead Google multi-disciplinary technology projects. Exp incl: mgmnt of tech security & dvlpmnt prog; cryptographic implement; public key cryptographic principles; X509 tech; & trust revocation tech.
SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:
#1615.370: design & implement srvr-sw; adv stat analysis; C++, Java, Python, Jscript, & HTML; & UI design.
#1615.4448; R&D of image process & 3-D comp vision algorithms; feature-based image match & rectification; stereo reconstruction; bundle adj; & C & C++.
#1615.5276; C & C++; thread & synchronize; syst prog; secure code & syst dvlpmnt; & oper syst interface or virtual mach.
#1615.4218; Java; data struct; algorithms; complex IT analysis; analyze & troubleshoot large-scale distrib syst; large syst sw design; Unix & Shell; SQL; & C++
#1615.3634; Java web dvlpmnt & Java EE; oo Jscript & Ajax; HTML & CSS; test frmwrks; Eclipse; & C++ & STL.
#1615.3519; API design; multithread & distrib syst; mobile pltfrms; web dvlpmnt; Java dvlpmnt; Jscript; CSS; Python; & automated test frmwrks.
#1615.1815; Java, Jscript, HTML, CSS, & Python; MapReduce prog; design & test user facing syst; text process & info extract; & launch & maint of robust web appl.
#1615.1626; C, C++ &/or Python; large scale data syst; concurrency prog in SMP environ; distrib syst perf & resource mgmnt; Linux perf mgmnt; & file syst, RPC & Linux kernel.
#1615.2513; entity resolution; Record Linkage Theory; large scale distrib syst, distrib file syst, & distrib database syst; fault tolerance & recovery methods for distrib syst; cloud compute; Java, Python, & SQL; & parallel algorithms.
BAL092MV, CA

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
Product Manager (Mountain View, CA) **#1615.822** Take responsibility for Google product from conception to launch. Exp incl: lead IT infrastruct prod dvlpmnt proj; perf monitor of complex syst; data analysis; Java; PL/SQL; oo technologies; sw design; tech presentations; algorithm dvlpmnt & implement; hw & sw integration; assessment of global & local bus trends & deliver new prod; price & mrkt strategy; proj mgmnt; analysis of mrkt opportunities; & competitive position.
System Integration Engineer (Mountain View, CA) **#1615.4708** Design, develop, modify, and/or test software needed for various Google projects. Exp incl: C; ARM or x86 assembly; firmware; Shell script; work w/OEM & ODM; & device driver dvlpmnt.
SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:
#1615.2328 C, C++ &/or Java; design large syst sw & dvlpmnt w/Unix environ; adv data struct, algorithms & op syst; optimization & debug distrib syst; & oo sw design.
#1615.3526 Java; C or C++; AJAX & XML; oo program; databases; design patterns; code refactor; data mine for info extract; prob & perf analysis of large scale distrib syst; & social graph data analysis.
#1615.444 Java prog, debug & unit test; Python, Perl or Ruby; Unix or Linux; web appl design & dvlpmnt; MVC; three-tier arch of web appl tech; factory pattern JSP/Servlet; databases; & distrib syst.
#1615.3353 oo sw design & dvlpmnt exp in large-scale sw library; industry standard use of unit tests, source control systems, & task track syst; dvlpmnt of sw for optimization; mach learn techniques; distrib compute; Perl or Python; Unix; data struct; algorithms; and C++.
#1615.433 C++; Java; web-related lang; design & analysis of algorithms & data struct; oo design & dvlpmnt; mach learn & pattern recognition; math modeling; large scale data process, data mine, & distrib compute technologies; dvlpmnt of large scale client-server appli, web svcs, & related technologies; & mentoring.
#1615.3515 oo prog; algorithms; data struct; computation complexity; C++ ; Java; Python; & Unix.
#1615.3748 C, C++, or Java; Python; data struct, algorithms & analysis of algorithms; analysis & troubleshoot large-scale distrib syst; & IP ntwrkng, ntwrk analysis, & perf.
#1615.3550 C++; Java; adv algorithms & data struct; distrib syst; syst eng'g; remote procedure calls; multi-thread & concurrent prog; & mach virtualization.
#1615.415; Java, C, or C++; oo prog; large syst sw design & dvlpmnt; Unix; data struct; & algorithms.
#1615.3344 large syst sw design & dvlpmnt; data struct; algorithms; oo tech; C & C++; Java; Linux; TCP/IP & ntwrk prog; client-srvr interaction for mobile clients; Android dvlpmnt; Python, Jscript, or AJAX; & Open GL.
#1615.4125 oo sw design & implemnent; large scale distrib syst infrastruct; data mining algorithms & appl; dvlpmnt process; C++; & Geo.
#1615.661 C or C+; Java; Unix; ntwrk admin; oo technologies; technical presentations; & algorithm dvlpmnt & implement.

Interested candidates send resume to: Google Inc., PO Box 26184 San Francisco, CA 94126 attn: Lisa Harrington. Please reference job # below:
Site Reliability Engineer (Mountain View, CA) **#1615.1797** Provide technical support necessary to ensure full availability of Google online services. Exp incl: Java, Python & R; monitor large-scale distrib syst; & perf eval of large-scale syst, incl resource usage, load balance, logs analysis, & bottleneck ID.
Software Engineer in Test Positions (Mountain View, CA) Design, develop, modify, and/or test software needed for various Google projects. Exp incl:
#1615.3882 C, C++, Java, or Python; Linux oper syst; mach learn; design & implement build & test infrastruct; design, implement, test, & maint of complex subsyst; comprehension & modify existing code base; & identify relationships between parts of complex proj.
#1615.3960 C, C++, Java, or Python; integrate test frmwrk; latency test frmwrk; & unit test frmwrk.
SW Eng Positions (Mountain View, CA): Design, develop, modify, and/or test sw needed for various Google projects. Exp. incl:
#1615.439 mach learn; stats learn; info retrieval; algorithm design; prog design & oo prog in C++; & syst design for high perf computational prob.
#1615.3724; stereo reconstruct techniques; GPU-accelerated algorithms; independent research in Image Process & Comp Vision; & color adjust & tone corrections of large sets of input images.
#1615.982; C++, Java, or Jscript; Unix; QA/testing; oo tech; data struct; data analysis; & algorithm dvlpmnt & implement.
#1615.3041 C or C++; Java; multithread; Python; large scale distrib syst; parallel & distrib compute; mach learn algorithms; ad related syst; stats, incl conduct experiments & perf analysis of results to enable decision making for algorithmic changes to serving ads; stochastic model; internet search engines, incl crawl, index, & serve; & STL.
#1615.3349; C , C++ &/or Java; AJAX, HTML & CSS; & web appl dvlpmnt.
#1615.1844 oper syst; distrib comput; Linux kernel; C++; & algorithm design tech.
#1615.1409 develop & maintain large scale fault-tolerant data syst & large scale parallel & distrib syst; distrib algorithms; C++ &/or Java; & dvlpng &/or manage perf sensitive data syst.
#1615.1589 C & C++; STL; Python; SQL; parallel & distrib compute; math optimization algorithms for mach learn syst & stats data analysis; & data struct & algorithms.

SHARKTANK

TRUE TALES OF IT LIFE AS TOLD TO SHARKY

Is That in Mythical Man-Millennia?

This pilot fish is one of a group of contractors providing IT services to the pension systems for a very large city. "We maintain employment information for more than 75,000 past and present city employees, and payroll and HR information for more than 20,000 retired employees, totaling approximately 2TB of electronic data and document images," fish says. But after a big Cobol conversion project, management decides to do an IT audit in order to justify cuts to the consultants' billing rates. And how far into the audit questionnaire does it become clear the auditors are clueless about this IT environment? Section 3, on system backup and disaster recovery. Reports fish: "Question 5 read: 'If all data on your computer/storage were lost and all backup tapes destroyed, how long would it take one person to re-enter it manually?' "

Just What We Need

IT director pilot fish gets a cold call from a newbie sales rep for a storage vendor. "I told him most of our applications are hosted," says fish, "but we have about 2TB of data on a small SAN we were thinking of replacing. While he was describing the product, I jumped on the vendor website and saw that their smallest array is 8TB and uses SSD storage. I told him I thought the solution was too big and probably too expensive because of the SSD. He asked, 'What's SSD?' So I quickly made up that it stands for Safe Storage and Destruction. His answer: 'Oh yes, it will safely store everything you want, and destroy all the data you don't need anymore.' "

Snarl Mail

Consultant pilot fish is trying to make some email system adjustments with this hosting provider, but things have bogged down because the tech support guy has a shaky understanding of how email works. Fish: Look, mail travels through the Internet using SMTP. Tech support: "No it doesn't. It uses MX protocol. 'SMTP' is just an alias for 'mail server.' And every mail server on the planet *must* have a login on every other mail server on the planet. Otherwise mail won't flow." Fish: What idiot told you this? MX isn't a protocol; it's just a record in DNS. Look it up on the Internet if you don't believe me. And what you're claiming would result in an impossibly unwieldy authentication system. Tech support: "My boss said so, therefore it must be true. And he tells me that the Internet lies." So he did get one thing right.

» **Even if you don't understand** SMTP, email me your true tale of IT life at sharky@computerworld.com. You'll snag a snazzy Shark shirt if I use it.

CHECK OUT Sharky's blog, browse the Sharkives and sign up for home delivery at **computerworld.com/sharky**.

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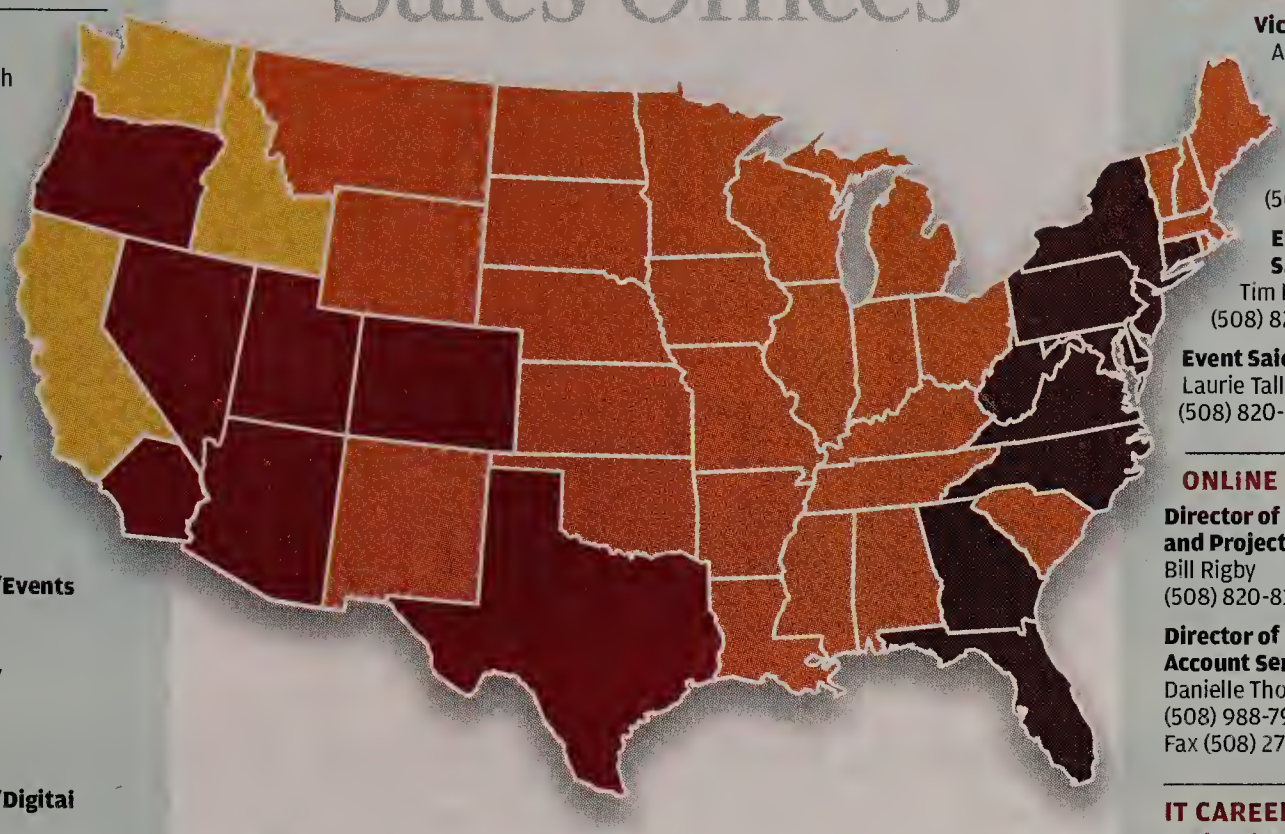

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SCOT FINNIE

5 Tips for Developing Successful Mobile Apps

> Many companies were gripped by a burning need to create mobile apps for little more than bragging rights.

THE INITIAL RUSH to build mobile apps is settling down, and none too soon. The world has endured the release of a whole lot of mediocre, or even useless, mobile apps. App stores everywhere are chock-full of them. Many companies were gripped by a burning need to create mobile apps for little more than bragging rights. What such apps did for users was often an afterthought. As a result, many corporate apps have languished in app libraries with very few downloads.

Some organizations will probably let it rest there, but others may learn from their mistakes and set out to create better apps. Here are some best practices that your company can employ to ensure that any apps you develop in the future are more intriguing to users:

1. In order to succeed, a mobile app must solve a problem, deliver important functionality, save time or money, entertain or enlighten, or offer a novel service. To put it another way: Successful mobile apps deliver useful benefits to the user.

My favorite example of an app that does something useful comes from Bank of America. Available in Android and iOS versions, the software lets you deposit a paper check by taking pictures of both sides of the check. The entire process takes about two minutes.

As a rule of thumb, anything the Web already does well doesn't need an app. That's why delivering your content, creating a marketing brochure or engaging in e-commerce are not especially useful benefits for a mobile app to deliver. Bottom line: Don't start building an app until you have a rock-solid idea.

2. Focus on one thing and do it well. My experience on more than one planning committee for mobile apps leads me to believe this may be the most important recommendation. It's far too easy to go feature crazy, which could wind up derailing your project later in the process. Brainstorming is good; let the ideas flow. But when you have exhausted that process, pare the ideas down to the best one or two.

3. If you build it . . . nope, they probably won't come. App stores aren't a direct channel to everyone who has a tablet or smartphone. In fact, unless you're in the business of developing software, you're probably better off spending your business development dollars in some other fashion. If lots of downloads are important to you, you'll have to do a good deal of promotion.

4. Apps need optional user notifications. With most mobile apps, the user must launch the application to check on new developments. Notifications aren't appropriate for every app, but when it makes sense to add them, don't miss the opportunity to do so.

5. Don't force users to run your app instead of visiting the corporate website, and don't make them go to the mobile version of the site (but do make a mobile version available). Mobile screens are getting bigger, and 4G cellular service makes the Web much more usable on mobile devices. Tablets in particular don't need a dumbed-down mobile version of your website.

Mobile browsers are improving. Instead of thinking that you can build an app that replaces your website, concentrate on improving the user experience and utility of the mobile version of your website.

If you've built a mobile app, feel free to add your own wisdom to my list of tips by tweeting to me or sharing with me on Google+. ◆

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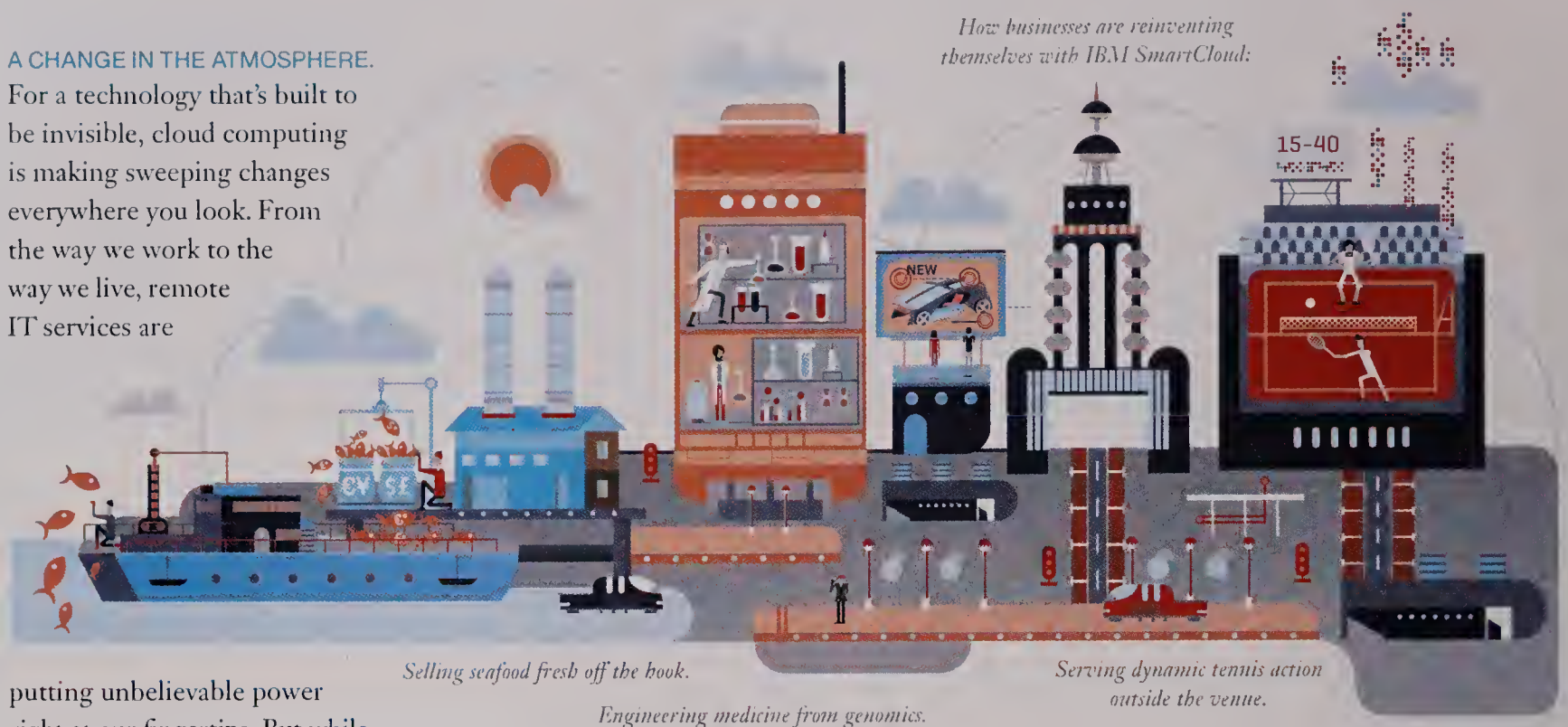

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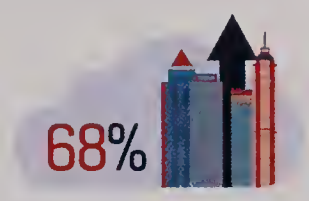
A CHANGE IN THE ATMOSPHERE.

For a technology that's built to be invisible, cloud computing is making sweeping changes everywhere you look. From the way we work to the way we live, remote IT services are putting unbelievable power right at our fingertips. But while more and more companies are discovering the extraordinary efficiency gains of the cloud, few are aware of how much potential is left untapped.



In a recent study, 68% of firms using the cloud to disrupt markets expected to outperform their peers.

YESTERDAY THE BACK ROOM, TOMORROW THE BOARDROOM.

At most companies, the cloud is taken at face value—a conduit for increasing flexibility and reducing complexity. Meanwhile, forward-looking businesses are rethinking the cloud to enable them to profit from an explosion of new social, mobile and analytics capabilities. They're transforming business models, disrupting industries and getting to market in no time.

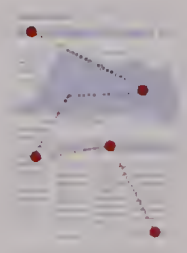
So conversations that were once held only in IT departments are now happening across the C-suite. And rapidly deployable resources like IBM SmartCloud give decision makers plenty to brainstorm about.

"Removing the burden of infrastructure really allows you to focus on improving your strategy and mission."

Marc Hoit, CIO, NC State

CLOUDS BUILT FOR RAINMAKING.

One such example is 3M. These early movers are using the cloud to analyze image design based on eye movement. Graphic artists everywhere can now upload their files and get instant feedback on what will most likely grab viewers' attention. It's a radically different proposition with untold, new market potential.



3M Visual Attention Service is a cloud-based tool for analyzing designs like this ad.

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